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A CULTURAL RESOURCES SURVEY OF PROPOSED PROJECT  
AREAS IN THE BUFFALO HARBOR, ERIE COUNTY, NEW YORK



A VIEW OF LAKE ERIE AND THE BAY FROM BUFFALO IN 1816

ARCHAEOLOGICAL CONSULTING AND SERVICES REPORT NO. 169

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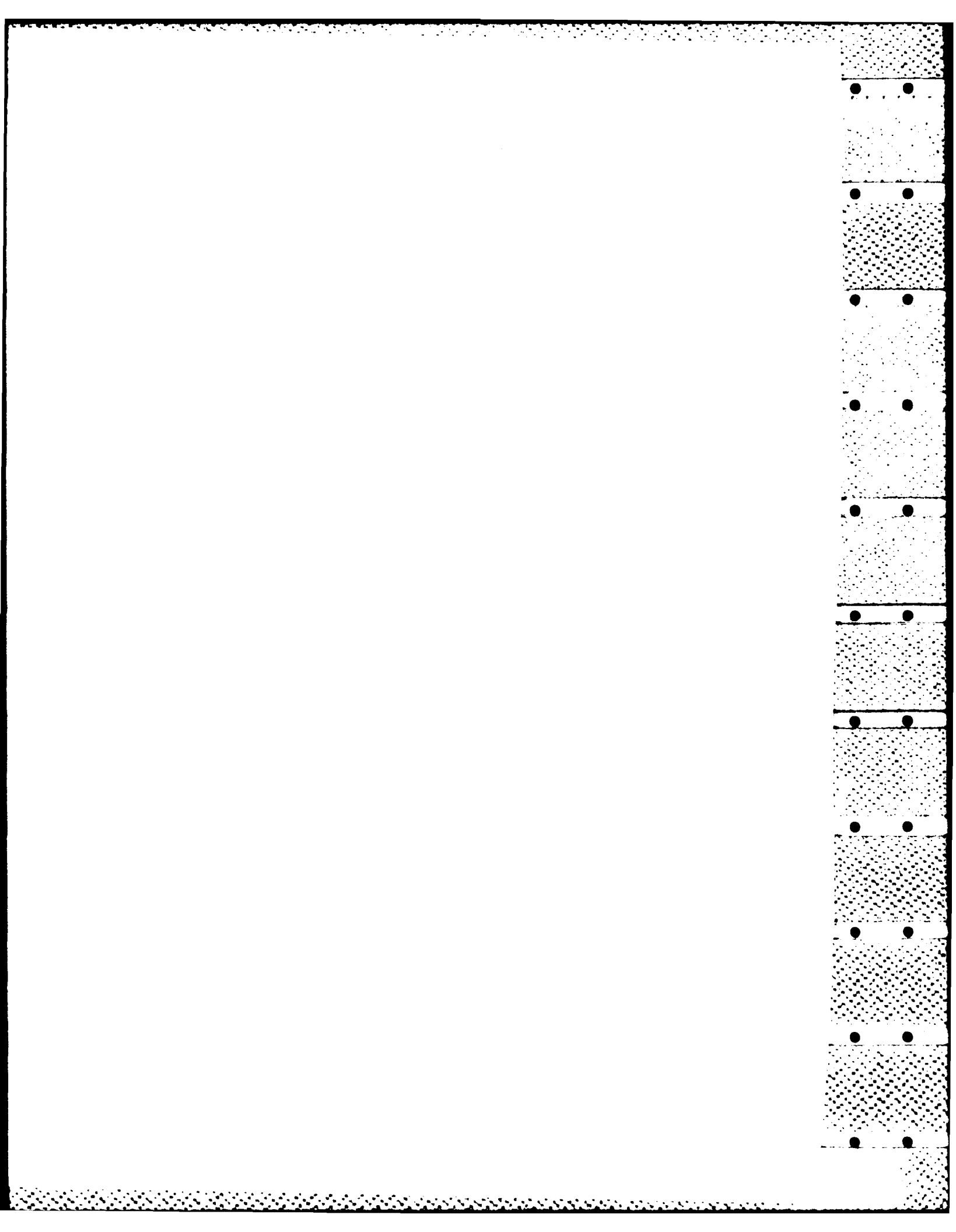
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A CULTURAL RESOURCES SURVEY OF PROPOSED PROJECT  
AREAS IN THE BUFFALO HARBOR, ERIE COUNTY, NEW YORK

Submitted To: Buffalo District  
U.S. Army Corps of Engineers  
1776 Niagara St.  
Buffalo, New York 14207

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Principal Investigators: Philip H. Salkin  
Richard Zeitlin

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Abstract

In August and September, 1983, the author and Dr. Richard Zeitlin conducted a cultural resources survey of a proposed project area in the Buffalo Harbor in Buffalo, New York. Review of archival sources and the preparation of the report continued through the Fall of 1983.

It is the opinion of the investigators that this proposed project will probably not endanger any cultural resources which would qualify for the National Register of Historic Places. Almost all of the project area lies underwater in the harbor area. The small portion which is on land is in an area which has been filled and is highly disturbed. It is possible that some shipwrecks might be impacted by the proposed dredging. It is unlikely that any of the shipwrecks would qualify for the NRHP, but additional archival information should be obtained on any wreck encountered and some artifact retrieval should be done prior to the disturbance of the wreck site.

While no significant sites will be disturbed by this project (with the possible exception of the shipwrecks), the Buffalo area has numerous important historic and prehistoric sites. Therefore, changed in the nature of the project area should call for review to ascertain whether any of these sites might now be included in the project area.

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## INTRODUCTION

### Scope of Services

In August and September, 1983, Philip H. Salkin and Dr. Richard Zeitlin from Archaeological Consulting and Services, conducted a cultural resources survey of portions of the Buffalo Harbor and the adjoining shoreline in the city of Buffalo, Erie County, New York. The purpose of the survey was to provide a cultural resources overview of the project area and identify sites which may be impacted by the proposed harbor improvements. The project area will be impacted by a number of activities designed to remove drift and debris from portions of the harbor and their sources of origin. Several different alternatives may be considered for implementation. The removal of the debris will facilitate commercial use of the harbor area. This project was conducted for the Buffalo District, Corps of Engineers, by Archaeological Consulting and Services under the terms of Contract No. DACW49-83-C-0040.

Cultural resource surveys of this nature are mandated by a series of pieces of legislation and executive orders. These include the National Historic Preservation Act of 1966 (P.L. 89-665 as amended), the National Environmental Policy Act of 1969 (P.L. 91-190), the Advisory Council on Historic Preservation: Procedures for the Protection of Historic and Cultural Properties (36 CFR, Part 800), Executive Order 11593 and the Corps of Engineers, Department of the Army, Identification and Administration of Cultural Resources (33 CFR, Part 305).

The project area includes portions of the Buffalo Harbor area from Strawberry Island on the north to just north of the heliport site on Fuhrmann Boulevard. Several potential project alternatives are being considered by the Buffalo District, Corps of Engineers. They are summarized in Appendix #5. The project area will be restricted to the waters in the harbor, except for a potential corridor running from the shoreline to Fuhrmann Boulevard and the Buffalo Skyway (New York State Highway 5). This corridor will be the southern terminus of the project area and will be only about 400 meters long.

The project area was altered from the area originally addressed in the proposal and the author understands that some further modifications may be made. Strawberry Island will tentatively not be impacted by this project but the island was included in the study area to allow for some flexibility for change in project design.

This survey had a number of project goals and desired end products. Its primary goal was the production of a planning

document for the Buffalo District, Corps of Engineers to aid that agency in fulfilling its responsibilities towards cultural resources in Corps-administered properties, or in areas to be impacted by Corps of Engineers projects. At the same time, this document was to be a scientific study which may serve as a basis for future studies both in and out of the project area.

Several tasks were associated with this project. These included an intensive literature and records search on the project area. This task included the identification of key data repositories. The second task was the field survey of the project area. The immediate shoreline area was also examined, although the project should only effect the corridor north of the heliport. The final task was the preparation of the report detailing the results of the survey.

### The Report

The two principal investigators had complimentary responsibilities for this report. Salkin wrote the sections on the physical setting of the project area and the methodology. He also wrote the sections dealing with the prehistory and prehistoric sites of the general project area and the historic period up to 1825. He wrote the section on the shipwrecks and provided the recommendations for the wrecks, the prehistoric sites and early historic sites. Salkin was responsible for the editing and assembly of the report. When the term "author" is used, it refers to Salkin.

Dr. Zeitlin was responsible for a discussion of the historic cultural resources for the period after 1825. He provided the recommendations for those sites and structures and also gave some input into the section on shipwrecks.

This report has the following sections;

- Introduction
- Physical Setting of the Project Area
- Methods
- Cultural Setting of the Project Area
- Cultural Resources in the Immediate Project Area
- Field Survey
- Summation and Recommendations
- Curation
- Bibliography
- Appendices

The discussion of the cultural setting of the project area is based on the results of the literature and records search.

It includes mention of numerous prehistoric and historic sites which are not in the project area but are important to an understanding of the culture history of the general area and the events and developments in the project area. The literature and records search also produced a list of sites which are (or were) located near the project area. The recommendations section places an emphasis on the importance of sites in, or in the immediate vicinity of the project area in terms of the potential for inclusion in the National Register of Historic Places.

## PHYSICAL SETTING OF THE PROJECT AREA

### The General Area

The project area is located in Buffalo Harbor in the city of Buffalo, Erie County, New York. It is located in the west-central portion of the county, on the northeastern shores of Lake Erie and at the southern end of the Niagara River (Figs. 1-2).

Erie County encompasses an area of about 1,047 sq. miles. The northern two-thirds of the county, including the project area, is included in the Central Lowland Province. More specifically, it is located in the Southern Ontario Province of the Erie-Ontario Lowland. This is generally an area of low relief including featureless old lake bottoms with some rolling hills. Slopes are generally less than 2% (Thompson 1966: 33-34). The elevations in this area are usually between 183 and 275 meters above sea level. Lake Erie has an elevation of 175 meters above sea level. The boundary of the Southern Ontario Plain with the Tonowanda Plain to the north is the Onondaga Escarpment with an elevation of around 213 meters above sea level (Fig. 3).

This area is underlain by Paleozoic sandstones, Onondaga limestones, conglomerates, shales and coals (Atwood 1940: 188). Above the horizontal layers of sedimentary rock is glacial drift of a relatively young age. End moraines are a prominent feature of the area (Pirkle and Yoho: 206). The glacial till is responsible for the presence of limy soils in the area (Fig. 4).

The vegetation cover in this portion of the state is primarily the elm-red maple-northern hardwood associations (DeLaubenfels 1966: 92). Prior to the extensive utilization of the area by Euro-American populations, the oaks were more prominent. There were also small prairies in Erie County, including in the Buffalo area.

Water resources are plentiful in the general area and this must have been an important factor in the location of prehistoric populations in the area. Buffalo is located on Lake Erie, the shallowest of the Great Lakes, with an average depth of only 19 meters. The shoreline of the lake changes frequently due to wave action, ice flows and debris (Drescher n.d.). Another water resource is the Niagara River which connects Lake Erie with Lake Ontario through the Niagara Falls. Other water resources include the Buffalo River, which with its tributaries, Cayuga and Cazenovia Creeks, flows through the city. A series of smaller creeks, such as Eighteen Mile and Cattaraugus, flow into Lake Erie south of the city of Buffalo.

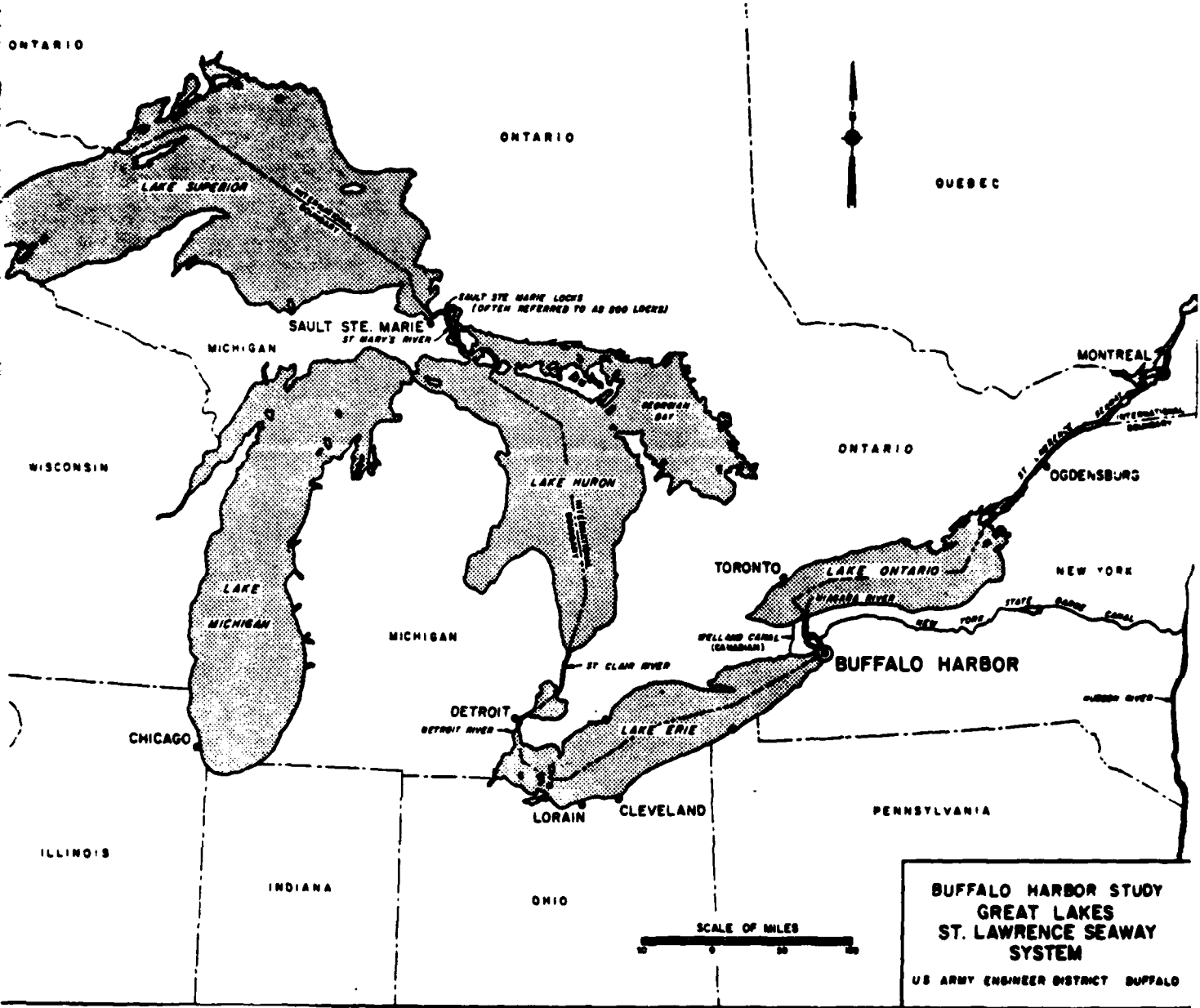


Fig. 1 - The Location of Buffalo, New York  
(U.S. Army Corps of Engineers, Buffalo District Map)

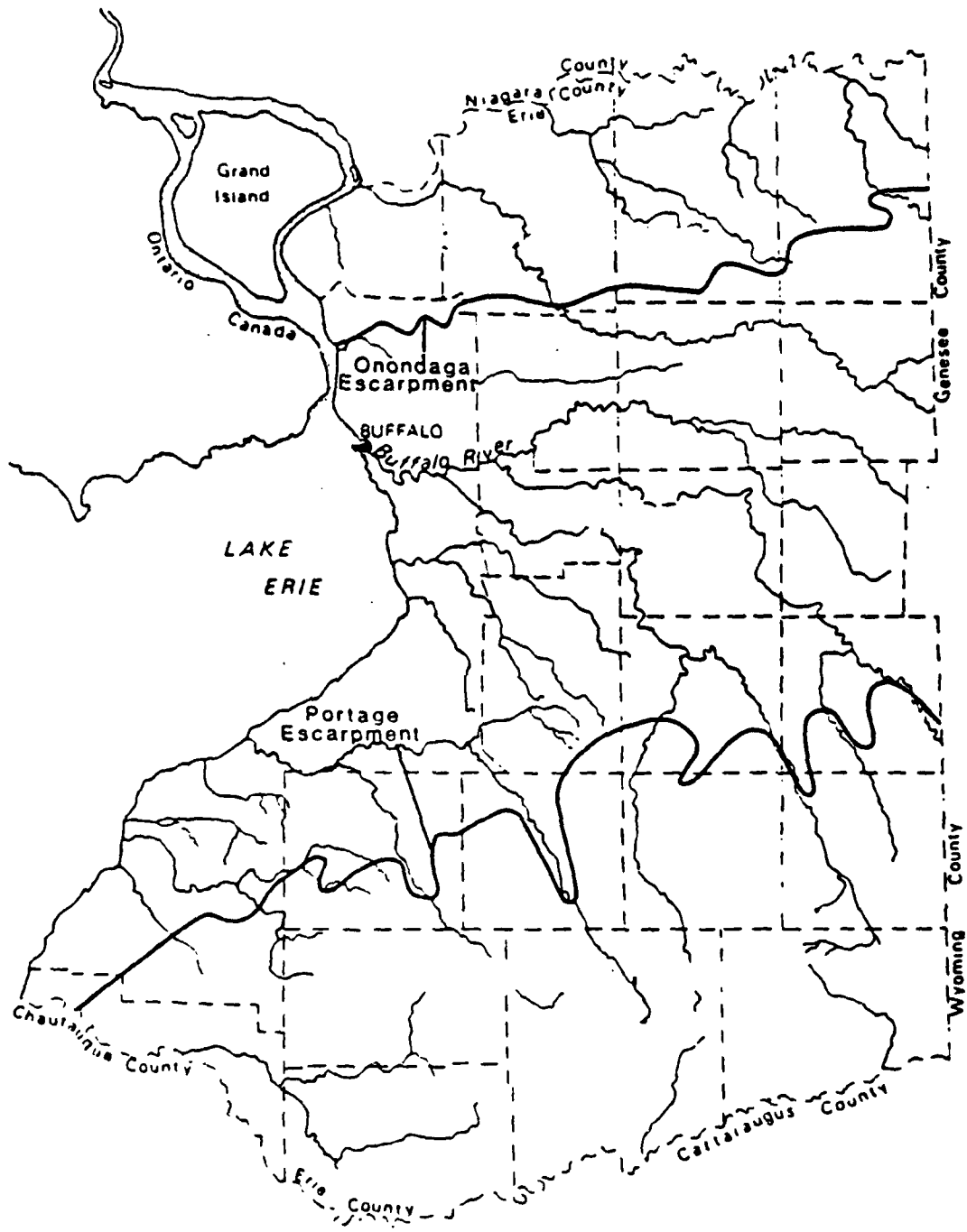


Fig. 2 - The Location of Buffalo in Erie County  
(U.S. Army Corps of Engineers, Buffalo District Map)

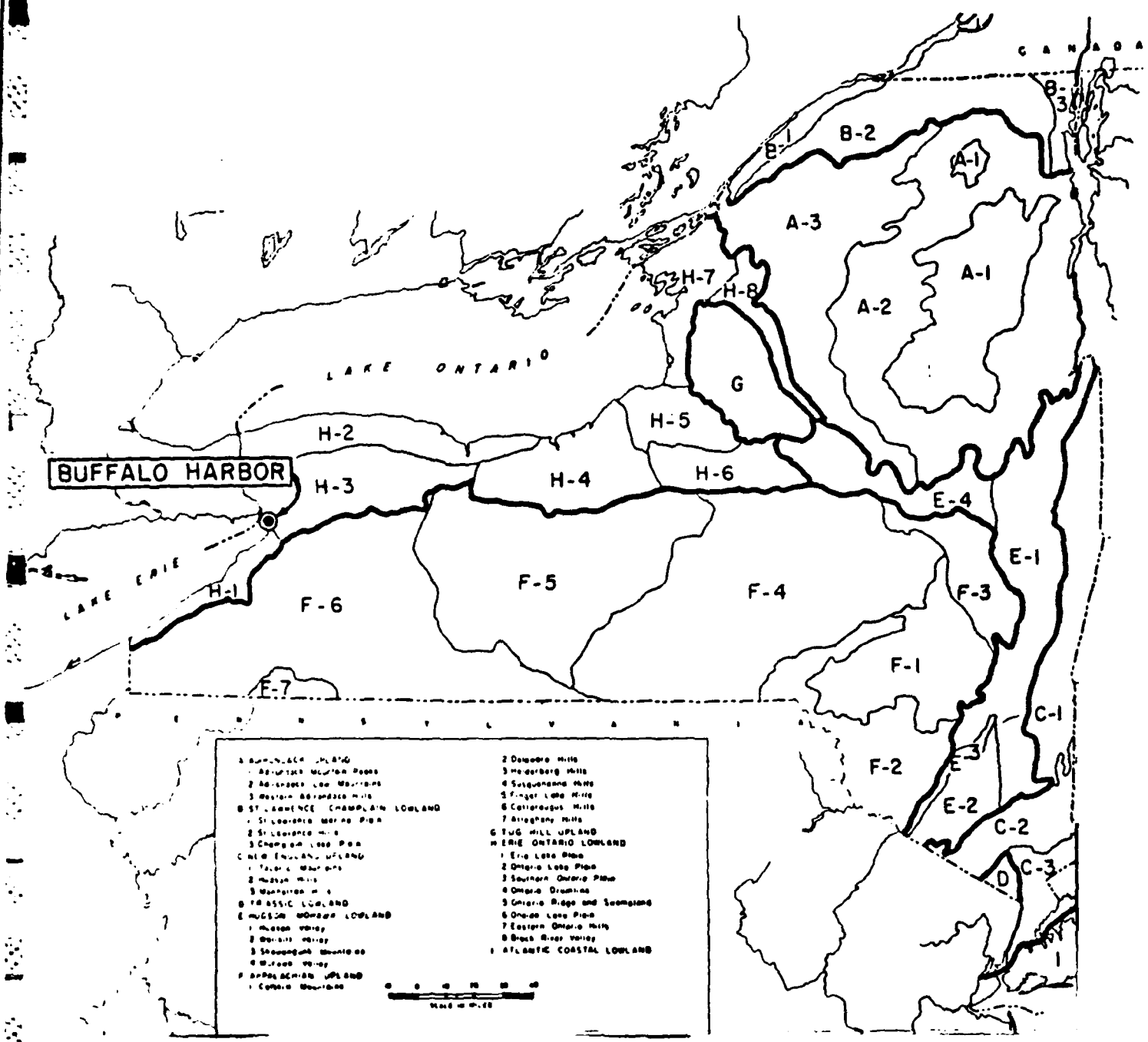


Fig. 2 - The Geographic Provinces of New York  
 (U.S. Army Corps of Engineers, Buffalo District Map)

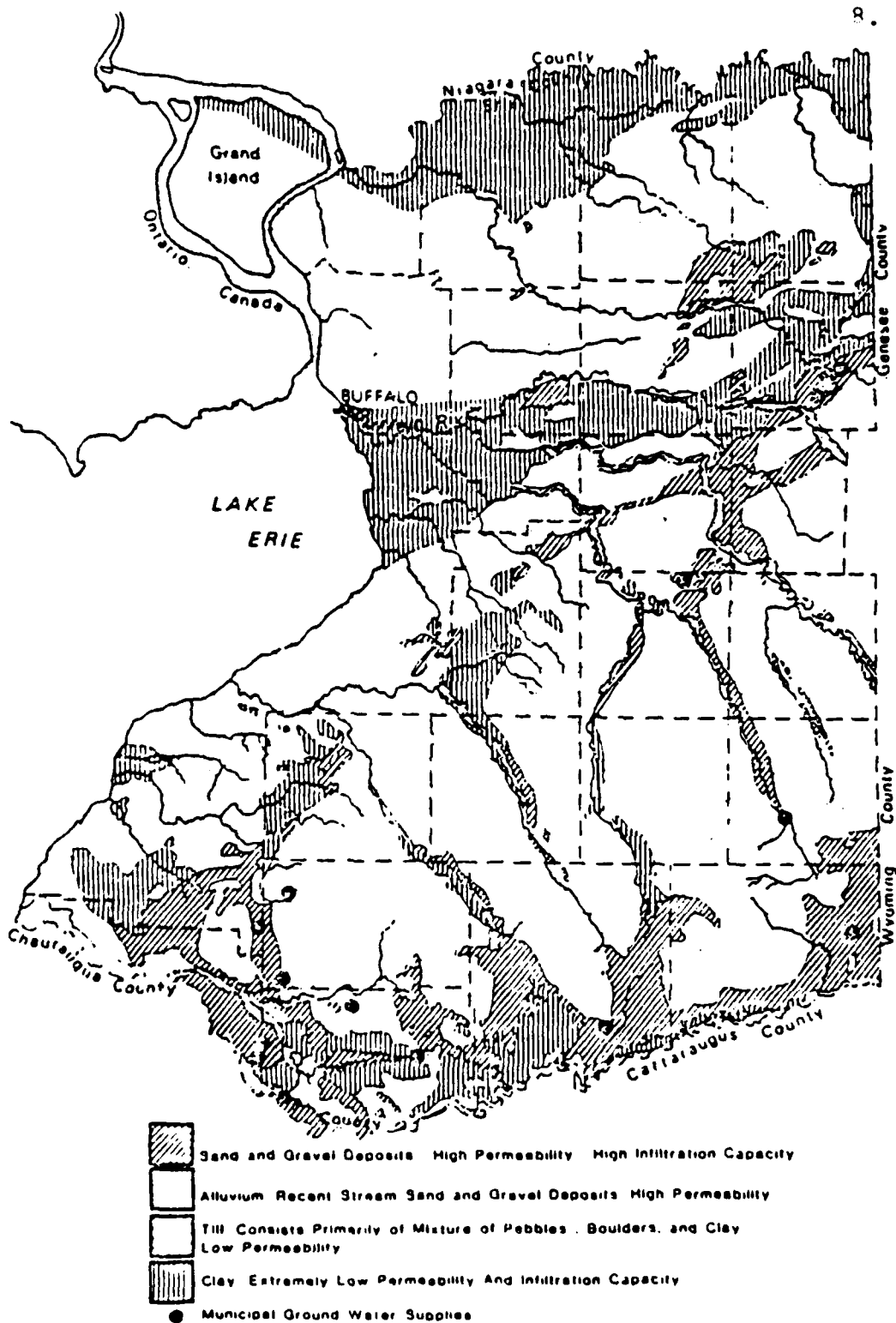


Fig. 4 - Surficial Deposits in Erie County  
 (U.S. Army Corps of Engineers, Buffalo District Map)

The climate in this portion of New York State is temperate, moderated by the Great Lakes. The mean annual temperature is 47°F with an average of 25.2°F in January and 70°F in July (Thompson 1966: 61). Rainfall averages 89 cm. a year and over 200 cm. of snow falls (Thompson 1966: Table 12). An important aspect of the climate of the area is the length of the growing season. In the Buffalo area, it is approximately 177 days long, as opposed to in inland Wyoming County, where the growing season is only 135-150 days long (White 1961: 18). Buffalo is an average of 4-8°F warmer in the winter. This extended growing season may have been an important factor in site location for the horticultural peoples of the Late Woodland Stage and historic Native American groups.

#### The Project Area

The project area includes about 10.7 km. of the Buffalo Harbor area from Strawberry Island on the north to the area immediately north of the Niagara Frontier Transportation Authority Heliport (Fig. 5). The project area is restricted to the harbor area except for a small area where it runs from the shore to N.Y.S. Highway 5, just north of the heliport. The project area flows under or past such landmarks as the Peace Bridge and the Erie Basin, the terminus of the old Erie Canal.

As noted, the project area is almost all in the Buffalo Harbor, with the exception of the one small area on its southern terminus. This area and the shoreline as a whole, consists almost entirely of made, or cut and filled land, as noted in some detail in this report. Hence, there are no native vegetation or soil types to describe. Much of the shoreline area was described as being marshy in 19th century historical accounts. The marshy condition of the area prior to development may have made the area one of low sensitivity for the presence of prehistoric sites. The filling of this area in the 19th and 20th century would also have a highly negative impact on the potential for finding prehistoric sites.

#### Strawberry Island:

Although not to be disturbed by dredging, Strawberry Island was included in the project area. It is possible that changes in the Buffalo Harbor might effect this low island which could be susceptible to increased erosion or deposition due to changes in stream flow or the size and volume of vessels using the area. It was thought that Strawberry Island might have some

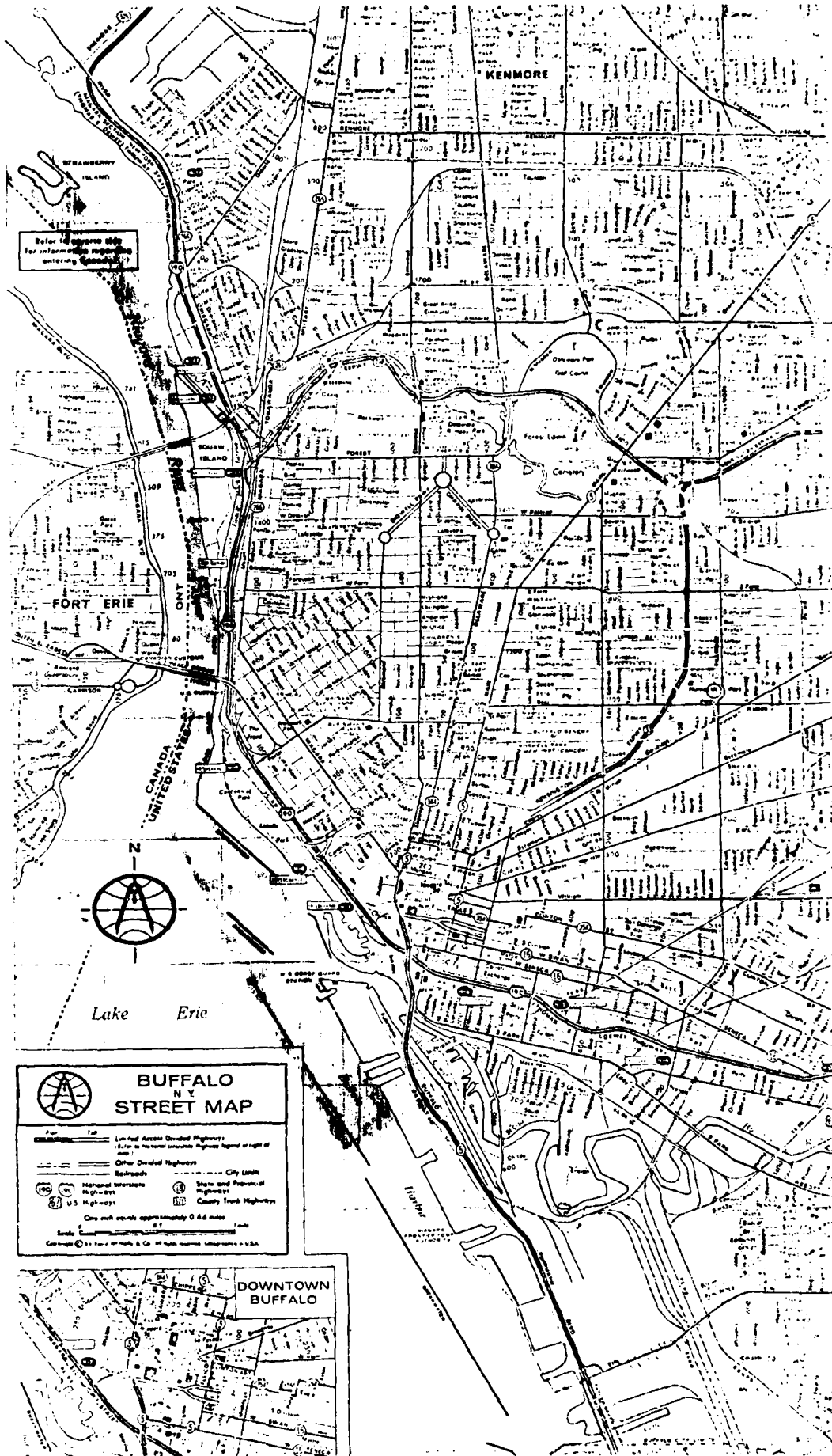


FIG. 5 The Project Area

potential for the presence of prehistoric sites, as other islands, like Squaw and Grand Islands have prehistoric sites present.

Today, Strawberry Island is a sand and gravel body which is highly disturbed. However, earlier maps of the area suggest that at one time the island was larger and undisturbed.

In 1819, Strawberry Island was 138 acres in size. It increased in size to 204 acres by 1912 due to the deposition of dredge spoil from the north end of the Tonawanda Harbor beginning in 1894 (Report U.S. Engineer 1894: 2444). In 1912, private commercial interests began mining the island for gravel. The Border Island Company (1912-1925) and the Buffalo Gravel Corporation (1926-1941) removed approximately 100 acres from the island's south end by 1926. Then work shifted to the north end. The Army Corps of Engineers used the island as a "U.S. Dumping Ground" after 1918 (Lake Survey 1918 Map).

By 1948, dredging activities and gravel quarrying had reduced the island to 36 acres. Today, the island has only about 25.3 acres above low water. The last gravel removal program was conducted in 1947-1950. An eight meter deep hole was dug in the interior of the island and 10.9 acres of surface material were removed. This accentuated the horseshoe shape of the island (Bossert 1973: 1).

Strawberry Island may have formed from sand and gravel deposited from the Buffalo Moraine by the Niagara River. An alternative hypothesis has the island formed by materials stirred up from the bottom of Lake Erie by southwesterly storms. The materials, moved through the narrow rapids by the swift current, dropped where the river widened and the current slackened (ibid: 2-4). The island probably has a rocky core.

The island was purchased by New York State from the Seneca in 1815. The first detailed map of the island appeared in 1856 (Williams and Woodruff 1856 Map). In 1953, the island was purchased by the Town of Tonawanda. It is used as an informal recreation area. It is also recognized as a wildlife area with a small wetland formed in the inside of the horseshoe in the dredged area. Some of the vegetation cover, at least, is the result of conservation plantings. The island is important as a spawning ground for large and small mouth bass, crappie, yellow perch, rock bass, sunfish and bullhead. Northern pike and muskellunge spawn on the island peripheries (Bossert 1973: 11). The island may also serve as a block to pollutants going from the east to west channels of the river.

## METHODS

A number of methods were utilized to conduct this project. The literature and records search portion of the project had an emphasis on identifying and exploiting all important data repositories. The field work methods emphasized an examination of the project area to determine the potential of the area to be the location of prehistoric sites and historic sites and structures.

### Literature and Records Search

The following data repositories were contacted during the course of this project:

- Buffalo District, Corps of Engineers
- Buffalo-Erie County Historical Society
- Anthropology Department - State University of New York at Buffalo
- Lockwood Library - State University of New York at Buffalo
- Buffalo and Erie County Public Library
- Office of the State Archaeologist of New York
- Office of Historic Preservation, New York State
- Office of the City Surveyor - Buffalo
- Division of Planning - Buffalo
- Office of the City Engineer - Buffalo
- Erie County government offices - various
- State Historical Society of Wisconsin - Madison
- Geography Library - University of Wisconsin-Madison
- Naval Intelligence - Archives
- Maritime Administration - Statistical Division
- Archaeological and Historical Literature
- Government Documents

Not all of the data repositories contacted were utilized. Calls to various departments of the Erie County government were not very productive and the author was advised that trips to those departments would not be very successful. A few remarks may be made about the key repositories utilized.

The Buffalo District, Corps of Engineers was an important source of information on the developments in the harbor. Of considerable interest was a document prepared by Daly and Ruggerio of the Buffalo District. Their document (1982) is a very

informative preliminary document on the cultural resources of the general project area. In many ways, this study is an expansion of their commendable work. The Buffalo District also has a number of individuals with considerable knowledge of the Buffalo Harbor and its background. These individuals were interviewed. One Corps employee was kind enough to take the authors out to Strawberry Island to examine that portion of the project area. The Buffalo Corps commissioned the work, "Engineers for the Public Good: A History of the Buffalo District, U.S. Army Corps of Engineers" (Drescher n.d.). This work contains a number of interesting points on the history of the Buffalo Harbor and the Corps of Engineers participation in harbor development. Various other Corps of Engineers documents were utilized and these will be discussed.

The Buffalo-Erie County Historical Society is an important source of information on the cultural resources of the project area. Of special interest are the map archives. Although somewhat difficult to use, the map archives contain hundreds of maps pertaining to Buffalo and Erie County. These maps are important in the understanding of the development of the harbor and shoreline area. Various maps were photocopied with the assistance of the staff from this agency and some appear in this report. The library at the society also contains a great deal of information on the prehistory and history of the area in the form of books, unpublished materials, collections and periodicals.

The Archaeological Survey of the Department of Anthropology at the State University of New York at Buffalo is the most complete source of information on the prehistory of the area. Staff and students from the university have long been active in the investigation of prehistoric sites in the Niagara Frontier. Many sites have been investigated as part of cultural resource management projects. The data in this repository comes in the form of site files, reports, survey notes and collections from hundreds of sites in the county. The files also contain notes on collections at the State University College at Buffalo and the Buffalo-Erie County Historical Society. Finally, there are a number of papers in the files done by Dr. Marian White and her students. These include analyses of collections made or acquired over the years. These papers are important sources of cultural/chronological information on the sites.

The Office of the State Archaeologist and Office of Historic Preservation for the State of New York both contain various files on the prehistory of the area. These files are not as complete as those at the Department of Anthropology, State University of New York at Buffalo, or at the Buffalo-Erie County Historical Society.

The Office of the City Surveyor and the Department of Planning for the City of Buffalo turned out to be important sources of information on the historic developments in the city and the harbor area. Various maps and reports extend well back into the 19th century. Of special interest were a series of maps which document the filling and development of the lakeshore area. The personnel in this office were very helpful and Dr. Zeitlin spent a complete day examining files and interviewing personnel. A number of maps were selected from their files for photocopying.

Another major source of data was the State Historical Society of Wisconsin in Madison, Wisconsin. This source was utilized both because of its proximity to the offices of Archaeological Consulting and Services and because it is one of the major national data repositories on American History, especially that of the Great Lakes. It has a large volume of information on Buffalo and New York State in general. Wisconsin has an historic tie to New York and was often called the "daughter state" to New York because so many of its early inhabitants came from there (Nesbit 1973, Salkin 1983). The Wisconsin Historical Society has almost all of the resources found at the Buffalo-Erie Historical Society and at the Lockwood Library. The Archives Division had various maps not found in the Buffalo institutions and these were photocopied.

Numerous books and periodicals were reviewed in the course of this project. Information on the prehistoric and historic Native American occupations of the area came from such sources as Squier (1851), Beauchamp (1900), Houghton (1909, 1920), Parker (1922), Ritchie (1944, 1969), White (1961) and Ritchie and Funk (1973). More specialized site reports were also examined.

Information on historic resources in the area, as well as background information came from such basic histories as those of Ketchum (1865), Johnson (1876), Smith (1884), Larned (1911) and the publications of the Buffalo-Erie County Historical Society. Important information on the development of the harbor and waterfront areas came from such work as those of Dart (1879), Symons and Quintus (1902), Wilkeson (1902), Graham and Severence (1945), Rapp (1947), Barrick (1970) and Drescher (n.d.). The annual reports of the U.S. Army Corps of Engineers were examined as they related to Buffalo from 1825 through 1950. Also examined were specific Congressional documents dealing with the development of Buffalo's waterfront.

For the prehistoric sites in the general project area, the emphasis was on locating them as accurately as possible and using multiple sources to generate data on the cultural/temporal parameters of the site. For example, maps at the Archaeological Survey of the State University of New York at Buffalo were used to get an overview of sites in the Buffalo area. Then, the files

were examined to gain information on the sites. After this, the collections were searched for artifacts from the sites.

For the historic period, an emphasis was placed on acquiring maps and charts which could provide chronological information on the developments in the harbor and lakeshore area. It was considered important to be able to document when particular portions of the lakeshore were developed or filled. Thus, even though specific information on certain structures was not readily available, it was known that the areas on which they were located were only created at such a time. Various files were also used to identify historic structures in the area. Of considerable interest was an inventory done under the auspices of the Coastal Zone Management Program of Buffalo.

#### Field Methods

The location of almost the entire project area under the waters of the harbor limited the extent of the field work and the methods employed. The literature and records search also indicated that the highly disturbed nature of the project area severely limited the potential for the presence of buried prehistoric and historic materials.

The project area was subjected to four complete windshield surveys. These surveys were conducted to allow the author to examine the waterfront for areas which might be the location of prehistoric or early historic sites. The surveys also allowed Dr. Zeitlin to locate and examine structures which could be potentially impacted by the proposed construction.

The windshield surveys were then followed by a pedestrian survey of much of the waterfront area in the vicinity of the proposed project area. This includes the area near the heliport site where the project may impact the only area not under water. The pedestrian survey included the examination of various construction sites, erosional cuts and areas of shoreline to help assess subsoil conditions. Limited shovel testing was done to obtain additional information on subsurface conditions. As will be further discussed, shovel testing was also done on Strawberry Island.

The pedestrian survey was conducted after most of the literature and records search was completed. This allowed the author and Dr. Zeitlin to examine historic sites and structures and assess their relationship to the project area. It also allowed the authors to assess the conditions in areas reported in the records as being disturbed and filled.

## CULTURAL SETTING OF THE PROJECT AREA

The following is a discussion of the cultural setting of the project area. The sections on the prehistory of the area and the history up to around 1815 are fairly generalized. The discussion of historic developments after 1815 will be more specific to the Buffalo area and the developments in the harbor.

### Prehistoric Period

The city of Buffalo can trace its existence back to less than 200 years ago. However, the area was occupied by Native American peoples for a period of perhaps 12,000 years or more.

Evidence from both archaeology and physical anthropology indicates that the Native American peoples are descended from East Asian populations who migrated to the New World during Late Pleistocene times. Migration was by way of the Bering Land Bridge (Berengia), a land body created by the lowering of sea levels due to glacial formation and expansion. Berengia was at times a formidable land mass, up to 1600 kilometers wide (Jennings 1974: 48). The climate was modified and warmed by the Japanese Current and Berengia was probably an area of rolling grasslands. It was attractive to large, grazing animals and other fauna and served as a corridor for migration of these species both to and from North America. It is likely that the first Americans entered the New World in pursuit of the species they were hunting in northeastern Asia (ibid: 51-52). The land bridge was in existence at various times in the past, including the period between 28,000 and 10,000 B.C., when the first peoples probably entered the New World.

Various claims have been made for an antiquity of up to 250,000 years for man in the New World, but these claims have gained little support. However, there is some growing evidence for sites of around 50,000 years in age. The evidence for these early occupations often comes in the form of relatively simple choppers and bifacial cutting tools. Most of the sites have been found in the western United States, Mexico, or South America. These include such sites as Old Crow and Kogruk in Alaska, Tule Springs, Calico Basin and Lake Manix in the western United States and Tequixquiac and Valsequillo in Mexico. Few of these sites are located in the eastern United States although the Kelly Site in Maine may fall into this group (ibid: 79-81).

Unfortunately, there are problems with all of these sites. They are either disturbed or the artifacts were recovered out of context. There is even debate over the human origin of some of the artifacts.

No sites of this stage have been reported for the vicinity of the project area. Claims of great age have been attributed to artifacts from an occupation at the Timlin Site near Cobleskill, New York (Raemsch 1977, Raemsch and Vernon 1977). These claims have not gained much acceptance.

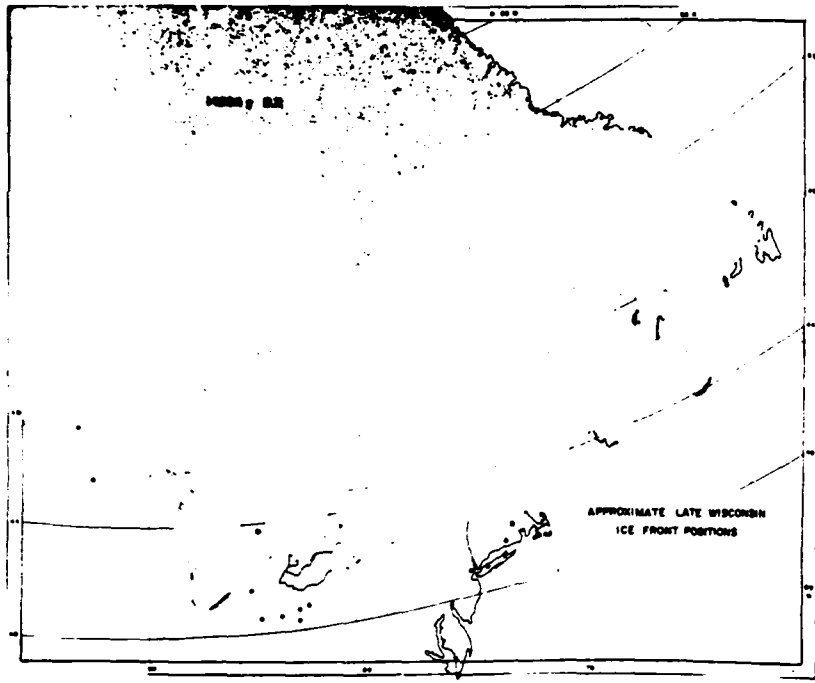
#### The Paleo-Indian Stage (ca. 11,000-7000 B.C.):

The oldest generally accepted archaeological manifestations in North America relate to the Early Paleo-Indian Stage cultures. This stage has a continental distribution between around 11,000 and 7000 B.C. Similar materials are also reported for sites of the same age in South America. Sites of this stage include both kill and camp sites. Some quarries have also been located. Most of the camp sites are small, but some, such as the Debert Site (MacDonald 1969), may have been repeatedly occupied on a seasonal basis. Many fluted points have been found in the major river valleys of Eastern Woodlands.

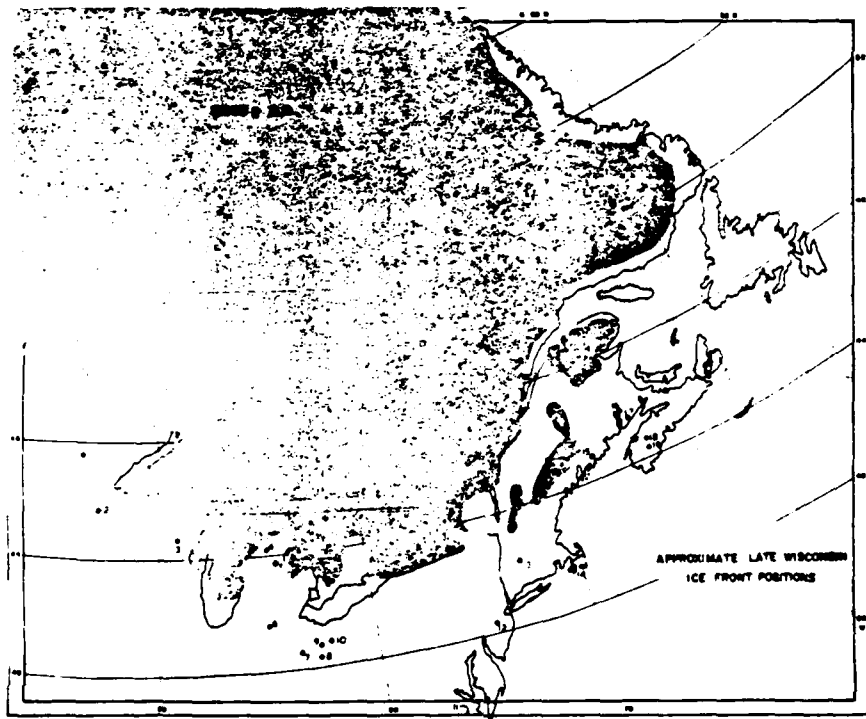
The subsistence pattern for these peoples was hunting and gathering. The exploitation of the now extinct Pleistocene megafauna was only the most dramatic aspect of their subsistence base. Hunting smaller animals and collecting plant foods were probably more important activities.

Sites of this stage are primarily identified by the fluted points made to tip stabbing spears. The flute, a groove on one or both sides of the point, was probably related to hafting. The remaining aspects of the tool inventory includes little more than scrapers, cutting tools, sharpened flakes, graters and hammerstones.

The Early Paleo-Indians were the first occupants of the general project area in western New York. At 14,000 B.C., the project area was covered by Cary Stage ice. By ca. 10,500 B.C., the ice had probably retreated sufficiently to allow for occupation of the area (Figs. 6-7). The retreating glacial ice left the Valley Head moraines in the area (Mueller 1977). After the relatively brief Port Huron advance, the ice retreated fairly quickly. The project area was probably not covered by either glacial lakes Tonawanda or Iroquois, which formed around 10,000 B.C. by glacial melting into drift-clogged basins. Additional land was opened up after 8000 B.C. when these lakes began to drain through the St. Lawrence River. The

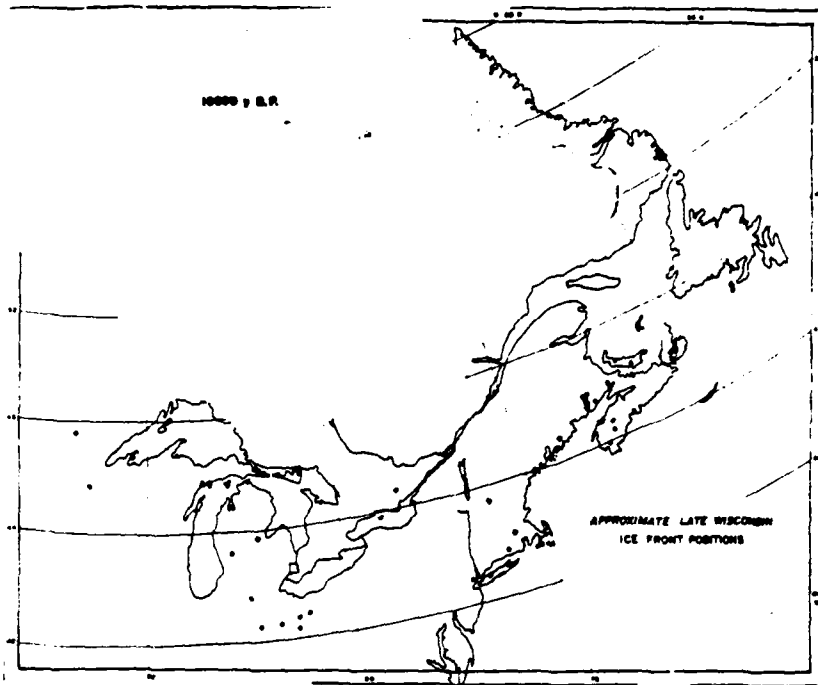


Ice-front positions ca. 14,000 B.P.

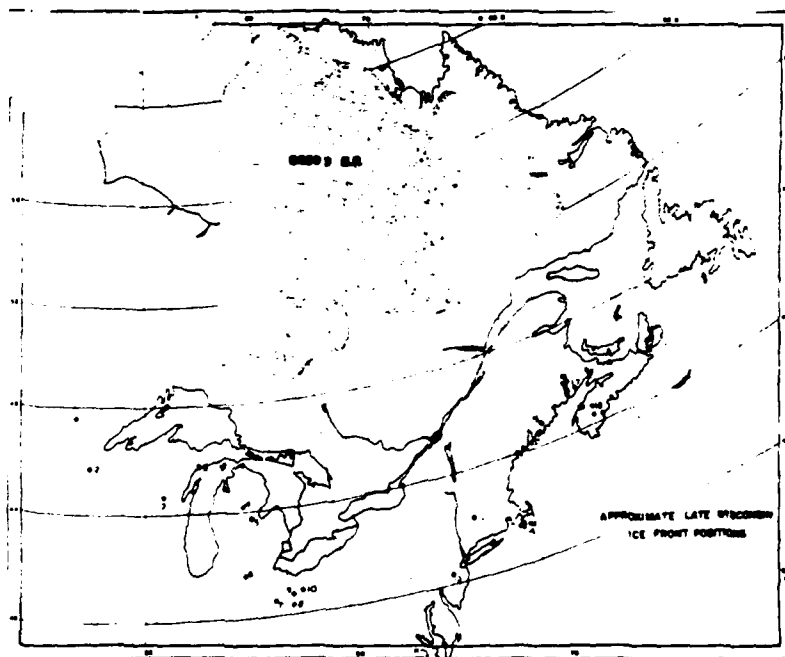


Ice-front positions ca. 12,000 B.P. Numerous small ice caps that persisted in New England, Nova Scotia, and Newfoundland until ca. 12,500 B.P. are not shown.

Fig. 6 - Location of the Ice Fronts in the Late Pleistocene (from Mueller 1977)



Ice-front positions ca. 10,000 B.P.



Ice-front positions ca. 8,000 B.P. Dotted line is approx. 100-m contour.

Fig. 2 - Location of the Ice Fronts in the Late Pleistocene and Early Holocene (from Mueller 1977)

vegetation in western New York at this time was probably a relatively open steppe dominated by non-arboreal species of the T1 and T2 Stages (Deevey 1958).

Various Early Paleo-Indian sites have been identified in New York State. These are primarily represented by the recovery of surface assemblages or isolated points. Most of the sites are found on high, well-drained locations such as hills, drumlins, knolls and terraces. These higher elevations may have been especially desirable locations for observing game, including migratory herds (MacDonald 1968, Ritchie and Funk 1973). The sites are also clustered in major river valleys, which served as natural avenues of movement for wandering bands.

No Early Paleo-Indian sites have been reported for the project area or its immediate vicinity. However, several isolated points are reported for Erie and Niagara counties, especially in the southern portions of Erie County, as noted in Fig. 8 (Ritchie 1969, Calkin and Miller 1977). The remains of extinct Pleistocene mammals such as mammoth, mastodon and bison have been reported for Erie County (Ritchie 1969: 11, Fig. 3). Thus, it may be assumed that Early Paleo-Indian hunters and gatherers utilized the general vicinity of the project area.

Following the Early Paleo-Indian populations were the Late Paleo-Indian peoples who utilized graceful, well-made unfluted lanceolate points. The Late Paleo-Indian cultures were Terminal Pleistocene manifestations. Late Paleo-Indian hunters exploited both the waning Late Pleistocene megafauna and the modern species which were replacing them. As with the earlier peoples, the exploitation of small and medium-sized animal species and floral resources was probably more important than the exploitation of a narrow range of large mammals.

Late Paleo-Indian sites are primarily restricted to the southwestern United States, the Plains and the western Great Lakes. Late Paleo-Indian points have been recovered in the southeastern United States and along the fringe of the Eastern Woodlands. A small number of such points have also been found in western New York and southern Ontario (Ritchie 1969: 17-18). It is possible that the general vicinity of the project area was lightly utilized by Late Paleo-Indian populations, or groups which acquired similar implements. This hypothesis is not supported by the presence of direct evidence.

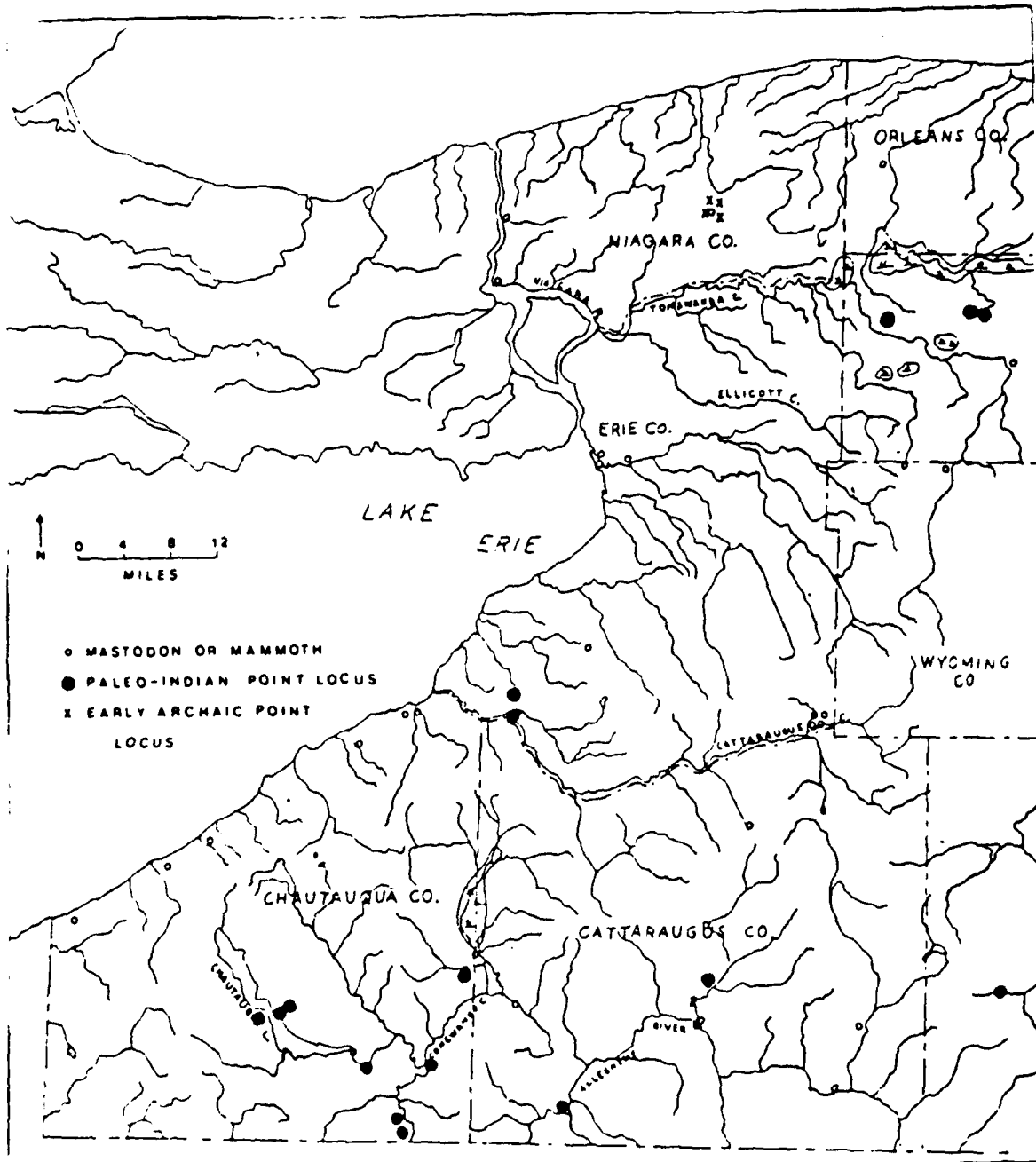


Fig. 2 - The Location of Early Paleo-Indian and Early Archaic Points and Extinct Pleistocene Megafauna in Western New York (from Calkin and Miller 1977)

### Archaic Tradition:

The Paleo-Indian Stage is followed in the eastern United States by the Archaic Tradition. This represents a long period of cultural adaptation to the post-Pleistocene conditions between roughly 8000 and 1000 B.C. The Archaic Tradition has been divided into three stages.

The Early Archaic Stage (ca. 8000-5000 B.C.) represents the beginnings of the transition into the long Archaic Tradition. At this time, the glaciers were retreating and the climate was warming, but still cool and damp. In some areas, large lakes were forming from meltwater backed up by dams of glacial drift. In other areas, such as the eastern Great Lakes, glacial lakes were beginning to be reduced as the receding ice opened new drainage-ways, or drift dams were broken.

In terms of vegetation, this stage corresponds to the A-4 Stage in pollen sequences. This is a time when spruce forests expanded into new areas to the north (Deevey 1958). Towards the end of the stage, continued warming was indicated by the transition into the B-1 Stage, with the decline of the spruce forests and an increase in birch and pine. Deciduous stands were present in small areas, in such protected environments as river and stream valleys.

The early Archaic Stage is best represented in the Southeast, which suffered less impact from the glacial advances. The stage is identified by a series of notched and stemmed point types which replaced the earlier lanceolate fluted and unfluted forms. Aside from the changes in projectile point forms, there is relatively little other evidence for innovation. The culture traits associated with many of the Archaic cultures developed in subsequent stages. Early Archaic points have been reported in the Northeast, indicating the gradual expansion of southern populations and/or cultural traits into this area (Dincauze 1976).

Early Archaic sites are not well-represented in New York. A few sites have been excavated in the Staten Island area and in the lower Hudson Valley and northern Pennsylvania (Funk 1976). It is possible that the expansion of southern populations was checked by the extent of the Carolinian forest types to which the Archaic populations were adapted. Calkin and Miller (1977: 309-310) reported several Early Archaic points in Niagara County and one in Cattaraugus County (Fig. 8). These finds are very rare and none of the points were reported for Erie County.

The dearth of Early Archaic Stage sites in the Northeast may be explained by the ecology of the coniferous forests

which dominated the area at this time. Fitting (1968) has noted that such forests are generally not suited to browsing animals and as such, would not be hospitable environments to hunting populations. This would have contrasted with the open grasslands associated with the glacial front areas which probably supported large herds of grazing animals.

The Middle Archaic Stage (ca. 5500-3000 B.C.) represents a time of considerable cultural change in the Eastern Woodlands, probably in response to climatic change. This stage corresponds to the C-1 and C-2 vegetation stages. Here, the conifers were decreasing in importance with the expansion of the deciduous forests. Oak, elm and hemlock all increased (Deevey 1958, David 1958). These changes were caused by rising temperatures and drier conditions. Sometimes called the Altithermal Period, this climatic episode endured until around 2000 B.C. The improved climatic conditions and the expanding deciduous forests formed a propitious environment for many animals and for useful floral species yielding nuts, berries and seeds.

In response to the developing forested conditions, new technologies were introduced or developed. These include the use of groundstone tool forms such as axes, adzes and celts. Also introduced were the drill, the spearthrower and a considerable diversity in fishing equipment. The inventory of chipped stone tools such as points and knives was also expanded.

In the Northeast, including the project area, sites of the Middle Archaic Stage are still few and are primarily represented by projectile point forms associated with Middle Atlantic and Southeastern cultures. Most of these materials are found in southeastern New York, which may have ecological implications (Funk 1972). Still, this stage was important as forming the basis for the major cultural developments in the Late Archaic Stage.

The Late Archaic Stage (ca. 3000-1000 B.C.) represents the culmination of the long period of cultural adaptations within the Archaic Tradition. During the time associated with the Late Archaic cultures, climatic conditions were still warm and dry, although there was some cooling by the end of the stage. The vegetation corresponds to the end of the C-2 and the C-3a stages. The oak forests decreased somewhat, while hemlock, elm and sugar maple increased (Deevey 1958). By 1000 B.C., the vegetation cover in the area was essentially similar to that found by the early European explorers 2600 years later, although there were certainly fluctuations and minor climatic and vegetation changes during this time.

By 3000 B.C., some populations had apparently become well-adapted to the numerous resources offered by the hardwood

forests of the eastern United States. This led to what Caldwell (1958) referred to as the "Primary Forest Efficiency." This was the efficient use of a broad range of available resources which allowed for increased population, a more stable settlement pattern and increasing cultural and technological complexity. In areas offering stable resources such as shellfish, the midden sites indicate the presence of large populations with expanded cultural inventories based on a focalization of the economy on these resources. Sites like Indian Knoll (Kentucky), Eva (Tennessee) and Boyleston Fishweir (Massachusetts) attest to the developments in this period. The Late Archaic Stage saw the beginnings of some of the traits which are primarily associated with the later Woodland Tradition; construction of mounds and other earthworks, village life, and the use of ceramics and cultigens. There is also evidence for trade over broad areas and some evidence for the beginnings of differential status burials.

In the Northeast, the Late Archaic Stage saw the first development of local traditions adapted to local ecological conditions and having distinctly local traits. In western New York, these manifestations include the Lamoka Phase and the Brewerton Phase of the Laurentian Tradition.

The Lamoka Phase sites are identified by the small, stemmed Lamoka points and by a distinctive bevelled adze. The sites are usually small camps, often found on small streams, marshes and springs, away from large waterways. These may have been small seasonal or special extractive sites. Larger base camps are located on large waterways or lakes such as the Lamoka Lake Site, the type site for this phase (Ritchie and Funk 1973: 337-338). Relatively little evidence for the Lamoka Phase is found in upland site locations or in rockshelters and caves. It is assumed that the Lamoka peoples were primarily oriented towards fishing and nut exploitation (Ritchie 1969).

The Laurentian Tradition consists of several phases distinguished by a series of often well-made groundstone tool forms and a number of side-notched and corner-notched projectile point styles. Brewerton Phase populations were also hunters and gatherers with perhaps more emphasis on hunting than with the Lamoka peoples (Ritchie 1946, 1969). Many of the Brewerton Phase sites were located on upland stations, as well as on small streams, marshes and large springs (Ritchie and Funk 1973: 339). Lamoka and Brewerton Phase materials are sometimes found at the same sites in western New York which may indicate interaction between the two groups.

Late Archaic Stage Lamoka and Brewerton Phase artifacts are the oldest materials found in the immediate vicinity of

the project area (Figs. 9-10). Lamoka points have been found at the Eaton (UB221), Buffalo K' (UB175) and Buffalo O (UB179) sites in the Buffalo area. Brewerton Phase points are also reported from the Buffalo K' and Buffalo O and the Creekside Grove sites (Salkin 1982) on Cayuga Creek. The Martin Site (UB214) on Grand Island apparently has a Late Archaic component, as does the Stephen White Site (UB300), located just north of the Erie County line and the Barnard St. site in Buffalo.

Almost all of these sites were found on the Cayuga or Cazenovia creeks. The Barnard St. site was located on the Buffalo River, and the Martin and Stephen White sites are on the Niagara River. Thus, all of these sites are on major waterways. This may well be a reflection of the non-systematic nature of site reporting or a reflection of settlement patterning.

#### Transitional Stage:

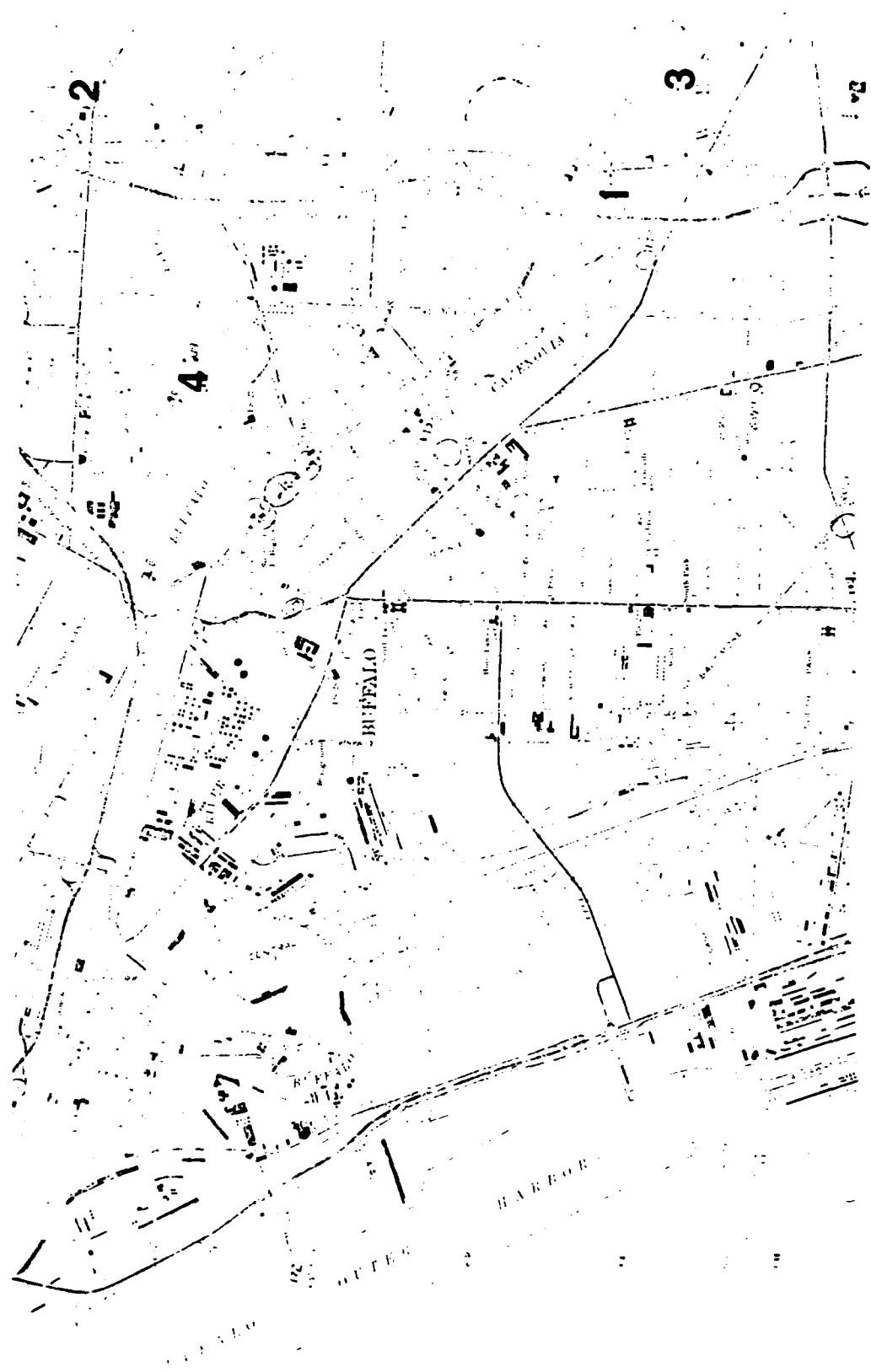
The Archaic Tradition in the Northeast is followed by the Transitional Stage. In other areas of the eastern United States, this stage is referred to as the Terminal Archaic Stage. The Transitional Stage (ca. 1500-750 B.C.) saw the renewal of extensive cultural inputs from the Southeastern and Middle Atlantic areas. These traits included various broad-bladed point styles and the use of steatite vessels. Dincauze (1968) argues for at least some indigenous development of these traits in the Northeast. The first ceramics also occurred at this time in the Northeast (Ritchie 1969, Salkin n.d.). These are of the Vinette I type, a thick ware with interior/exterior cord-marking. The origin of this type and related thick wares across the Great Lakes area to the Mississippi Valley is not yet known. They are not similar to the very early fiber-tempered wares of the southeastern United States.

The Transitional Stage in western New York is represented by the Frost Island Phase. Most of the sites of this phase are small camp sites (Ritchie 1969). Frost Island Phase populations may have had a riverine orientation in settlement pattern, but this is based on scanty data and the assumption that the transportation of heavy steatite vessels would have been easier by canoe or dugout (Ritchie and Funk 1973: 345).

Transitional Stage materials are not well represented in the general vicinity of the project area. The Buffalo O site yielded points of this stage and one point was found at the Creekside Grove Site (Salkin 1982). Both of these sites are

Fig. 9 - Location of Late Archaic Stage Sites in the Buffalo Area

- 1 - UB175 - Buffalo K'
- 2 - UB179 - Buffalo O
- 3 - UB221 - Eaton Site
- 4 - UB510 - Barnard St. Site



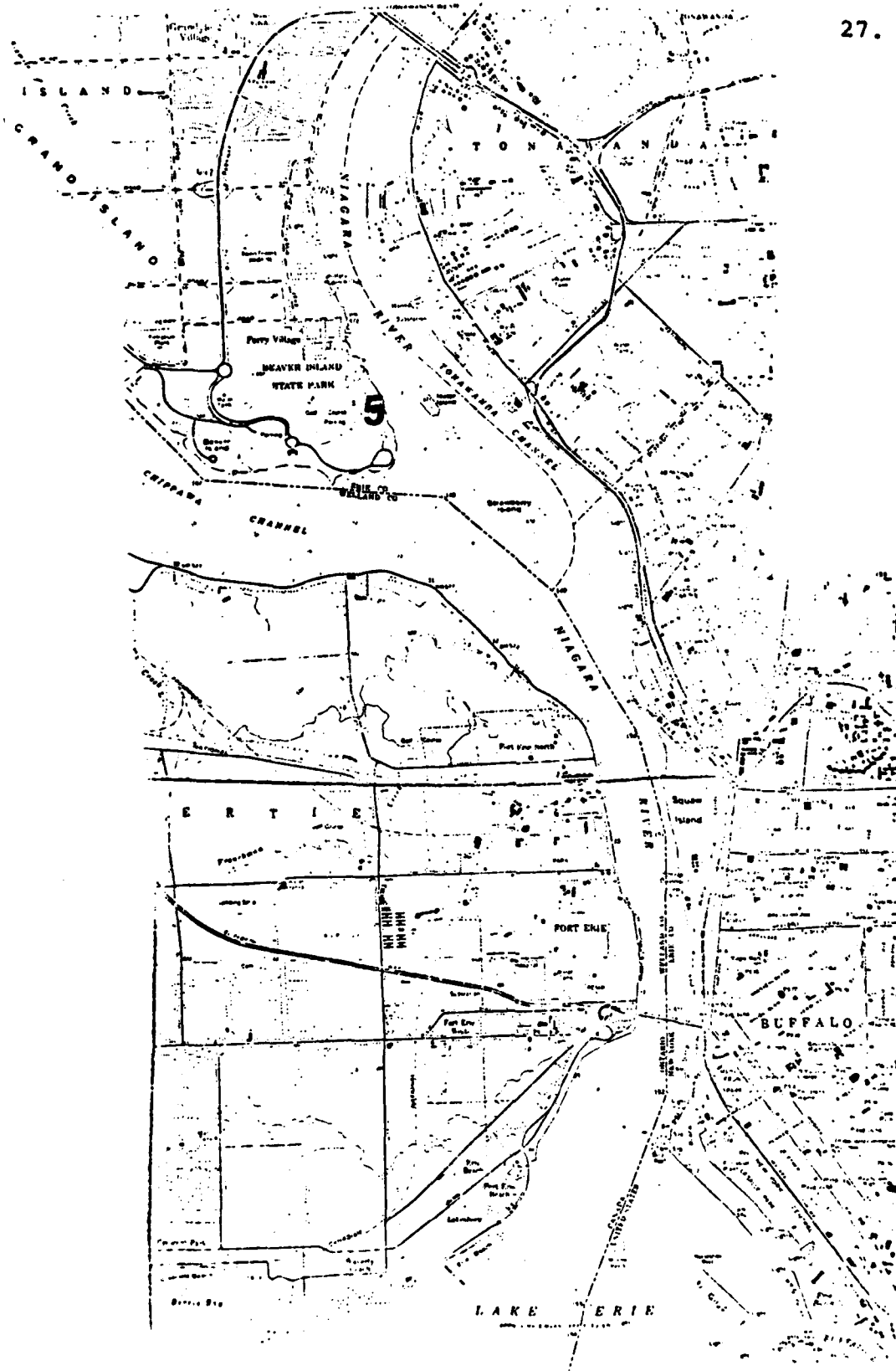


Fig. 10 - Location of Late Archaic Stage Sites in the Buffalo Area  
5 - UB214 - Martin Site

located on major creeks.

#### Woodland Tradition:

The Archaic Tradition in the eastern United States formed the basis for the subsequent Woodland Tradition (ca. 1000 B.C.-1600 A.D.). Out of the Woodland Tradition developed the horticultural/village lifestyles associated with the historic tribes of the Eastern Woodlands. The climate during this time was essentially the same as that of today, although there were fluctuations which had importance in regional cultural developments. The climate was somewhat cooler than during Late Archaic times and the oak forest decreased in favor of more cold-adapted hardwood species (Deevey 1958).

The Woodland Tradition is associated with a series of traits including the widespread use of pottery, the construction of mounds and other earthworks and the development of a horticultural subsistence base for village life. The bow and arrow was introduced in the latter part of the tradition. Cultigens included both local and introduced species. Some of the Woodland traits had their origin in Mesoamerica or were modified as a result of the input of cultural influences from that area.

Like the Archaic Tradition, the Woodland Tradition is divided into three stages. The Early Woodland Stage (ca. 1000 B.C.-300 B.C.) saw the beginnings of the traits which grew to characterize the tradition as a whole. Hunting and gathering was still the primary mode of subsistence for these cultures, although some groups utilized both imported cultigens as squash and corn and local cultigens as Chenopodium, Polygonum and Iva (Struever and Vickery 1973). Shellfish was also an important resource to many groups at this time.

In the Midwest, the Adena manifestation was developing with the first of the great Eastern Woodland art styles. The Adena peoples built large, multi-stage mounds and other earthworks, such as the "sacred circles." The Adena cultures may have extended into the Northeast in the form of migration or trading. This may have manifested itself in the Middlesex Phase of southeastern New York, New Jersey and the Connecticut Valley (Ritchie and Dragoo 1959, 1960). Unfortunately, these sites are represented almost entirely by mounds excavated by amateur collectors.

The Early Woodland Stage in central and western New York is represented by the Meadowood Phase (Ritchie 1955, 1969). This manifestation has such diagnostic artifacts as Vinette I pottery (very rarely found in earlier contexts) and side-

notched Meadowood points. Distinctive groundstone spear-thrower weights and gorgets were present as were copper beads. The presence of stone and pottery pipes indicates that smoking had become part of the socio-ideological complex.

Meadowood sites indicate a possible trend towards a more stable settlement system with the presence of storage/refuse pits. The sites showed a primarily riverine and lacustrine orientation with few upland sites. Fishing was a major activity although sites like Scaccia indicate that hunting and the collecting of floral resources were also important (Ritchie and Funk 1973).

The Meadowood Phase appears to be well-represented in the Buffalo area (Figs. 11-12). Sites include the Buffalo K', Buffalo G, Buffalo O, UB1815, Rumsey Village (UB453) and Barnard St. sites. The Martin Site is apparently a major Early Woodland station. The author examined a large ceramic collection at the State University of New York at Buffalo from this site. Just north of the Erie County line, the Riverhaven 1 and 2 sites are important Meadowood Phase components on Grand Island (Ritchie 1969, Granger 1978). Several other small Meadowood Phase components are also located on the eastern shore of Grand Island. Another site from this phase is the Sinking Pond Site in East Aurora, Erie County (Granger 1978).

The distribution of these sites is interesting. The Barnard St. Site and UB1815 are located on the Buffalo River. Buffalo K', Buffalo G and Buffalo O are located on the tributary creeks, Cazenovia and Cayuga. The rest of the sites are all located on the east shore of Grand Island (except Sinking Pond which is not in the Buffalo area). These sites include both major stations such as the Martin and Riverhaven II sites and small sites such as UB930, UB931 and UB932 (Granger 1978). Even in consideration of the unsystematic nature of survey work in this area, it is clear that Grand Island and the Buffalo area in general, were loci of occupation for the Meadowood peoples.

It may also be noted that several of these sites are reported to have yielded "Adena" points. This term has come to apply to a range of contracting stem point styles. Contracting stem points are a common feature of many Early Woodland assemblages in the Eastern United States and such points here should not be necessarily construed as representing Adena occupations or trade items.

The Middle Woodland Stage (ca. 300 B.C.-400 A.D.) in much of the Eastern Woodlands is practically synonymous with the Hopewellian manifestations. The concept of Hopewell may be viewed as a culture, an art style, a horizon or as a religion, depending on which region is in question. In the heartland

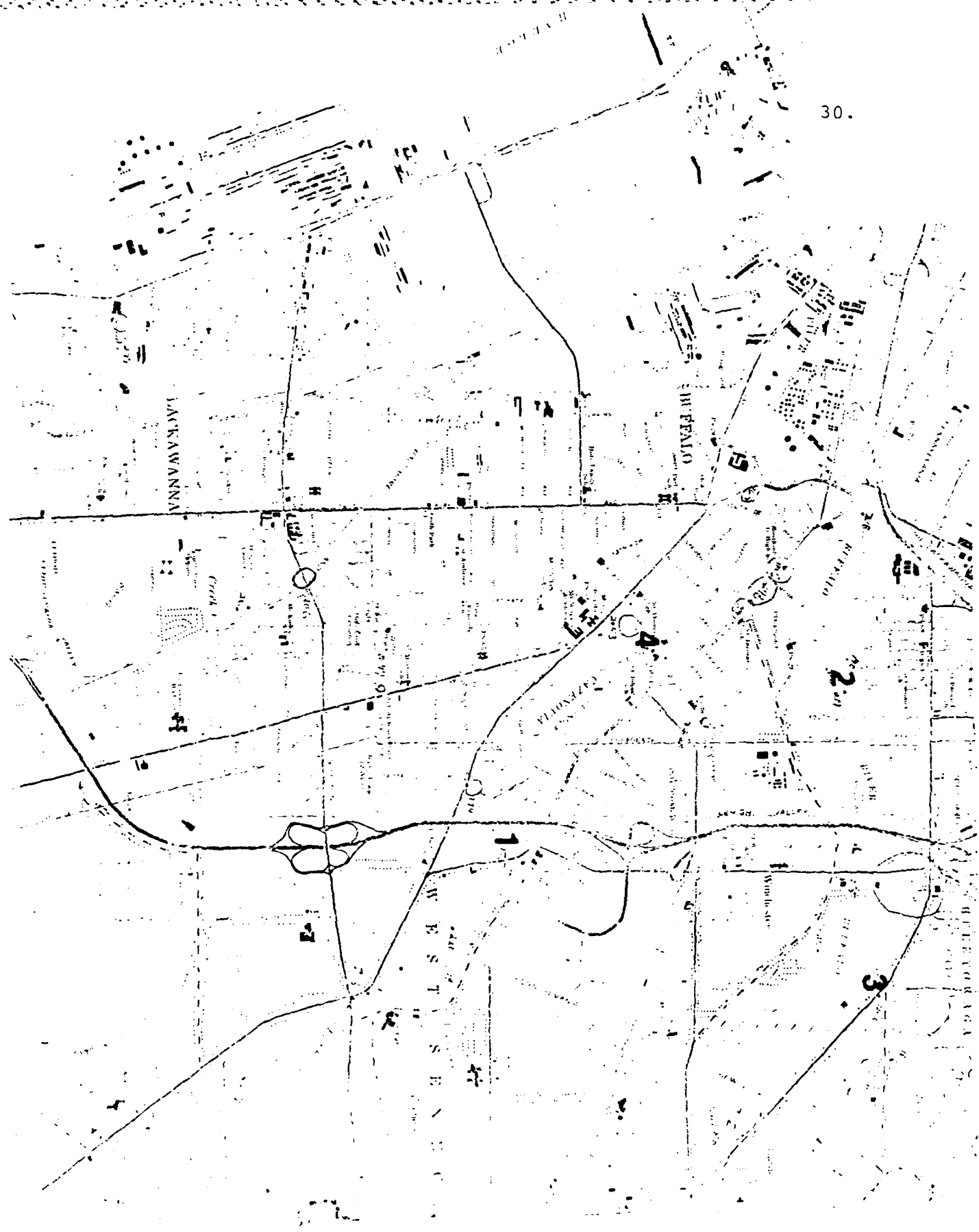


Fig. 11 - Early Woodland Stage Sites in the Buffalo Area  
1 - UB175 - Buffalo K'      3 - UB1815  
2 - UB510 - Barnard St. Site      4 - UB170 - Buffalo G

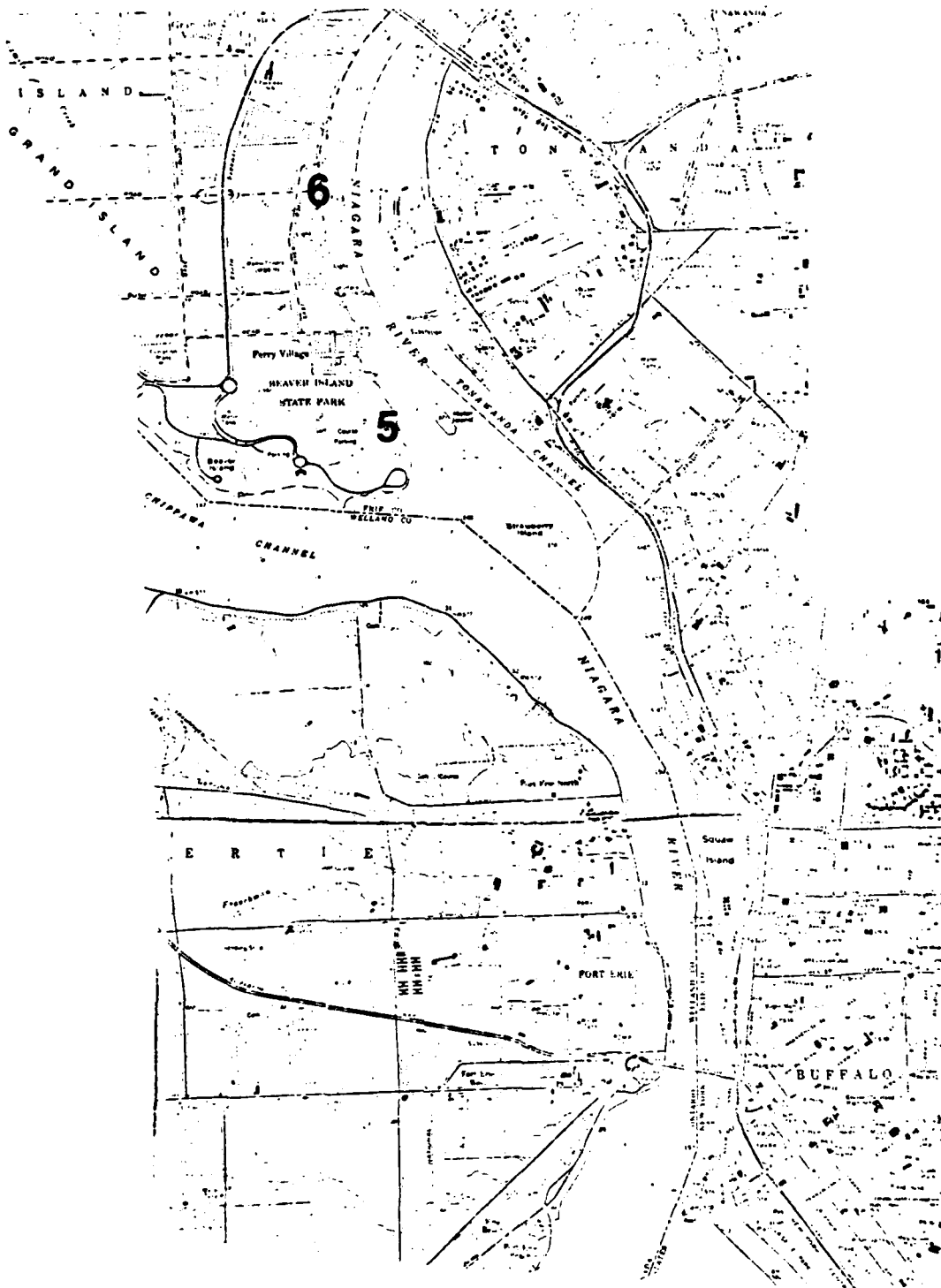


Fig. 12 - Early Woodland Stage Sites in the Buffalo Area

5 - UB214 - Martin St.

6 - UB453 - Rumsey Village St.

of the Hopewellian manifestation in Illinois, Indiana and Ohio, the cultures developed an elaborate art style and built large earthworks. An important aspect of Hopewellian society was the burial and ritual associated with the death of high status individuals. These individuals were often buried with status goods obtained through a wide-ranging trade network. This trade network was probably responsible for the spread of Hopewellian traits, including religious practices. Hopewellian cultures in the heartland area were probably ranked, or incipient class societies. The economy was still focused on hunting and gathering but the use of both domestic and imported cultigens is well demonstrated (Struever and Vickery 1973).

From its center in the Midwest, Hopewellian influence extended from the eastern Plains to western New York. More generalized Hopewellian influences extended even further into southern Canada and New England.

In western New York, the early Middle Woodland is represented by the Squawkie Hill Phase (Ritchie 1938, 1969). This phase includes the eastern-most distribution of mounds with distinct Hopewellian affiliations. These mounds were primarily excavated by amateur archaeologists and collectors, but it is clear that some of these mounds yielded artifacts made in the Hopewellian style. The relationship between the Midwestern Hopewell and the Squawkie Hill Phase is strengthened by the presence of trade goods in Squawkie Hill mounds made from Midwestern materials. Unfortunately, little is known of the nature of the occupation sites associated with this phase. There is no information on the subsistence base or settlement patterning.

In the general vicinity of the project area, the Tonawanda Island Mound (UB250) and the Armine Street Mound (UB248) may have been earthworks associated with the Squawkie Hill Phase (Fig. 13). Unfortunately, both of these sites have either been destroyed or extensively damaged. The Buffalo K' Site is reported to have yielded a Snyders point, a diagnostic of the Squawkie Hill Phase. Finally, the Cain Mound, a good example of a Squawkie Hill Phase mound, is located in the southern portion of Erie County (Ritchie 1969: 219).

A separate Middle Woodland development was the Point Peninsula Tradition. This manifestation represented a long period of cultural development in the central and western New York area which spanned the period between perhaps 100 and 800 A.D. The Canoe Point Phase represents the earliest aspect of this tradition. Sites of the phase are located primarily in the St. Lawrence River Valley and none are reported for the vicinity of the project area.

The Point Peninsula cultures of central and western New York were marginally exposed to Hopewellian influences. A few earthworks are associated with Point Peninsula sites, but these lack the distinctive Hopewellian traits found in the Squawkie Hill mounds (Ritchie 1969). While the older Point Peninsula sites have some Hopewellian traits, these declined in number through time. Later Point Peninsula sites of the Kipp Island Phase show the beginnings of the transition into the Late Woodland Owasco Tradition, which is ancestral to some of the historic Iroquoian groups.

Late Point Peninsula sites indicate a continuation of the trend towards a more stable settlement pattern. The sites are sometimes large and have storage/refuse pits. The settlement pattern shows a strong lacustrine orientation with proximity to large marshes and shallow lake margins. Sites are also found on major rivers. It is assumed that fishing was a major subsistence activity (Ritchie and Funk 1973: 354). There is no evidence for the use of domesticates, but Chenopodium has been found at Kipp Island Phase sites (Ritchie 1969: 241).

The Point Peninsula Tradition is not well-represented in the general project area (Fig. 13). Components may be present at UB1815 and at the Ditch Site (UB256). The author saw some ceramics in the Martin Site collection which probably relate to an Early Point Peninsula occupation.

The Hunter's Home Phase represents a transition from the Late Point Peninsula Tradition to the Owasco Tradition of the Late Woodland Stage. Various elements typical of the Owasco-Iroquoian cultural continuum appear during this phase (ca. 850-1000 A.D.), including more cord-impressed ceramic types, small triangular arrowheads and oblong structures which may be the prototypes of the Owasco-Iroquois longhouses (Ritchie, Lenig and Miller 1953, Ritchie and Funk 1973). Maize horticulture may have been present, but this is not supported by direct evidence. This phase is apparently not represented by major components in Erie County.

The Late Woodland Stage ends with the arrival of the early European explorers in the 16th and 17th century and the beginnings of written accounts of the Woodland tribes. In the Midwest, the Late Woodland Stage is held to begin after the decline of the Hopewellian manifestations and the rise of regional cultures after around 300-400 A.D. In the Northeast, the Late Woodland Stage begins with the transition from the Point Peninsula Tradition, through the Hunter's Home Phase, into the Owasco Tradition, ca. 1000 A.D. By the 1400's, the Owasco cultures developed into the protohistoric Iroquois.

The Owasco Tradition represents the Late Woodland Stage

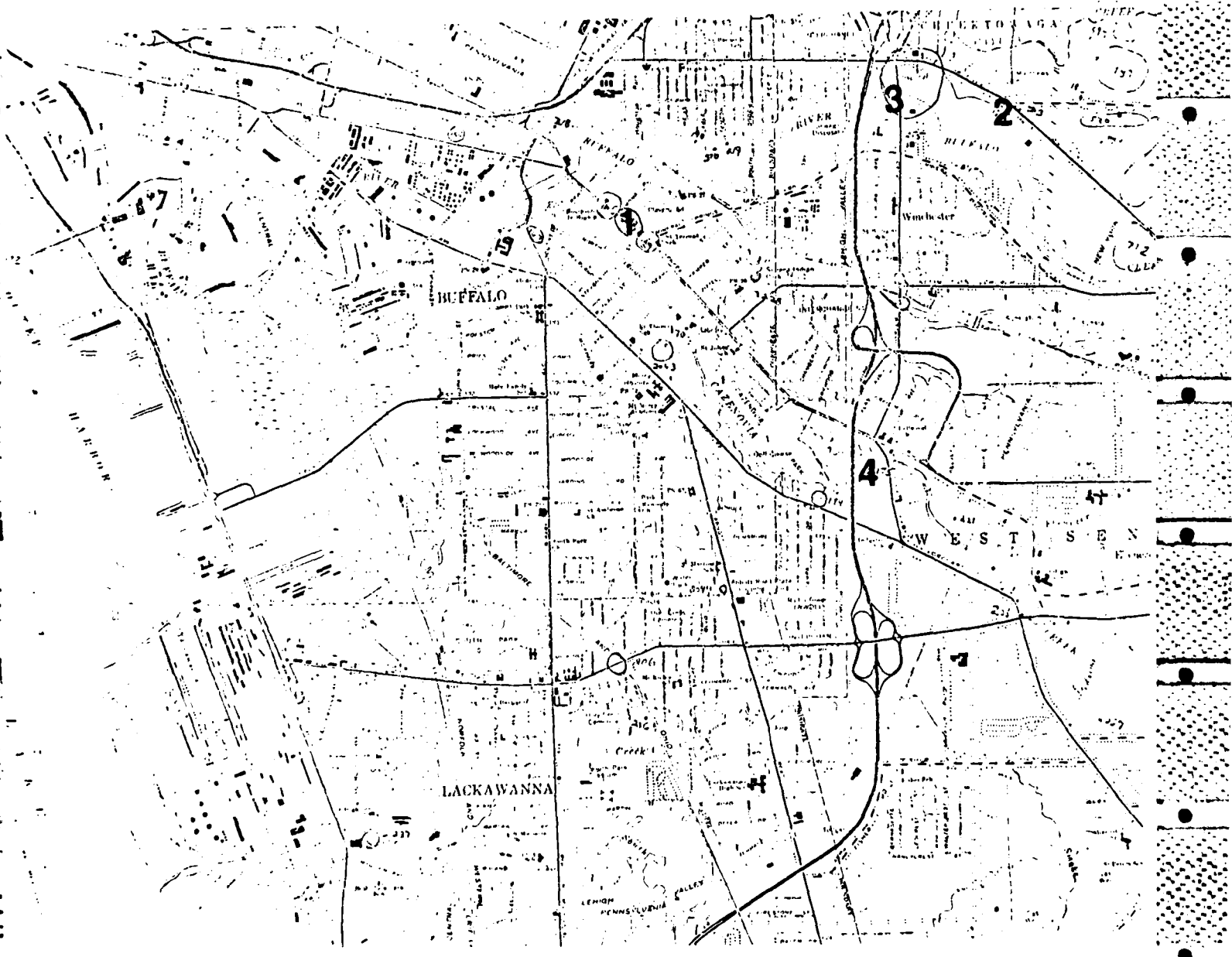


Fig. 13 - Middle Woodland Stage Sites in the Buffalo Area

- 1 - MB253 - Armine Street Mound
- 2 - MB254 - Ditch Site
- 3 - MB1215
- 4 - MB1216 - Buffalo M'

in central and western New York. Elements of the tradition extended eastwards into eastern New York and the western New England area. It consists of a series of phases developmental to the protohistoric Iroquoian cultures. Many basic characteristics of Iroquoian culture developed during this tradition including stable villages based on maize-beans-squash horticulture, supplemented by hunting and gathering and the use of the longhouse. By middle Owasco times, some of these villages were palisaded, indicating the rise of warfare. The ceramics include a variety of collared and uncollared wares with cord-impressions on cord-marked surfaces. The bow and arrow is present, tipped with small, unnotched triangular points of the Levanna and later Madison types.

Most of the major Owasco village sites are in central New York, including a concentration in Onondaga County. No major sites have been reported for the general project area, or Erie County as a whole, but it is clear that some Owasco presence was in the area (Fig. 14). Sites like Buffalo K', Buffalo G, Buffalo B (UB165), Buffalo Z (UB190), Murphy's Farm (UB198) and Barnard Street may have had Owasco components. Major village sites like Eaton Farm in West Seneca Township, Buffam Street and Seneca Indian Park in Buffalo, had prehistoric components which probably represented Owasco or early Iroquoian occupations as no European trade goods were present (Houghton 1909, 1920, White 1961).

Most Owasco sites are located relative to horticultural and defensive requirements. As such, many are located back from major streams, near small creeks and brooks, on high hills and on knolls (Ritchie and Funk 1973: 359). Such locations are present in the Buffalo area. It is interesting that the possible Owasco sites in the Buffalo area are not located on Lake Erie or the Niagara River. Rather, they are located on the Buffalo River or Cazenovia Creek. The Buffam St. Site is located about 750 meters north of the present location of Cazenovia Creek and 1.1 km. south of the present Buffalo River. This distribution of sites may be consistent with the Owasco settlement patterning in central New York.

#### The Historic Native American Period

There is considerable debate as to the cultural setting of the Niagara Frontier at the time of the arrival of the early French traders and missionaries in the late 16th and early 17th centuries. There is conflicting evidence as to which Iroquoian tribes were present. The evidence depends largely on the interpretation of early records and maps (Houghton 1909, 1920, Fenton

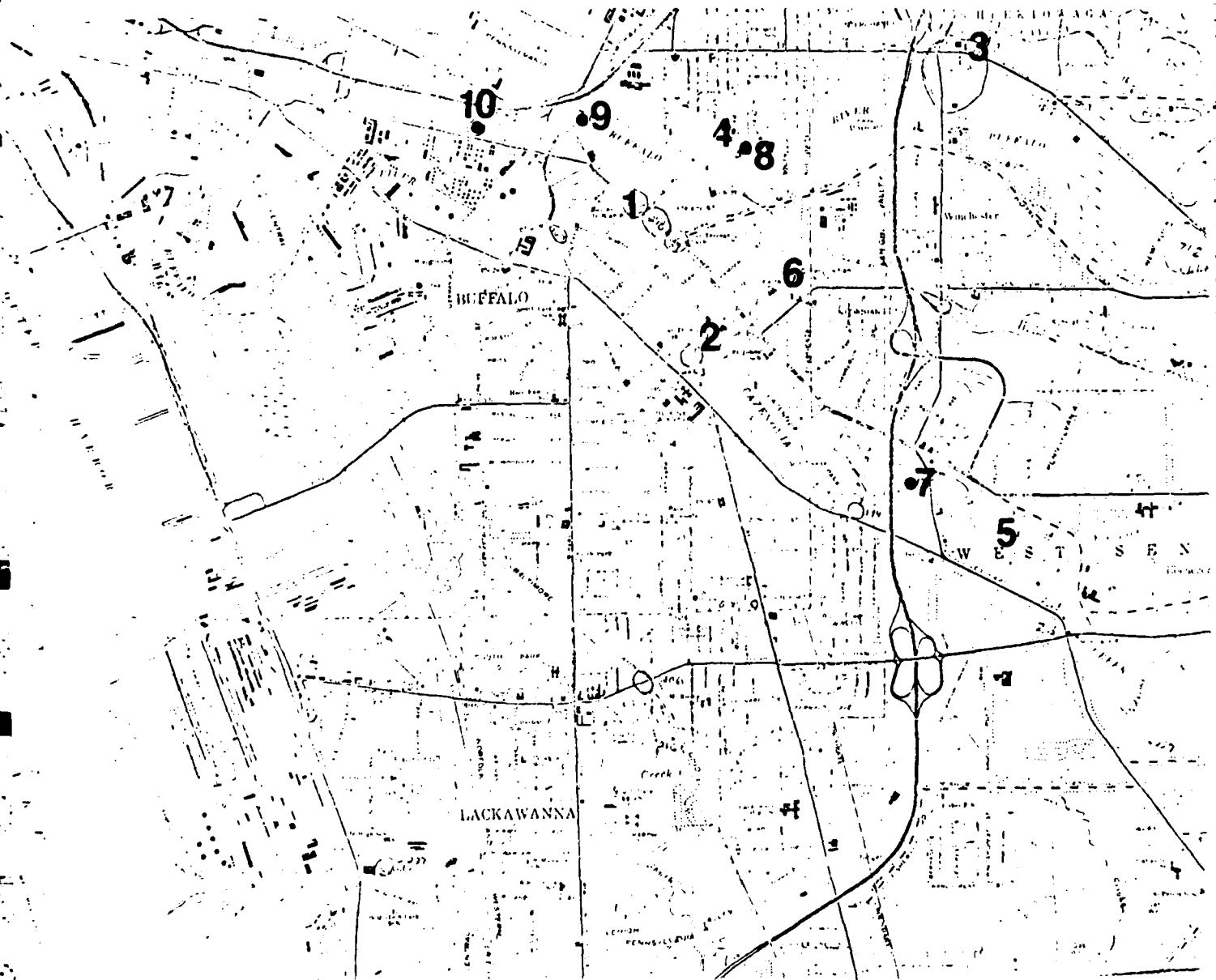


Fig. 14 - Some Late Woodland Stage and Early Historic Sites in the Buffalo Area

- |                                |                                  |
|--------------------------------|----------------------------------|
| 1 - UB166 - Buffalo E          | 7 - UB175 - Buffalo W'           |
| 2 - UB170 - Buffalo S          | 8 - UB510 - Barnard St.          |
| 3 - UB179 - Buffalo C          | 9 - UB218 - Seneca Council House |
| 4 - UB190 - Buffalo E          | 10 - UB188 - Buffalo X           |
| 5 - UB221 - Eaton Site         |                                  |
| 6 - Buffam Street Site - UB228 |                                  |

1940, White 1961 and others). The problems are exacerbated by the inaccuracy of some old maps and by misidentifications of local groups by early explorers unfamiliar with Native American languages and social organization. It was not unusual to have several different villages or clans of one tribe appearing in records as separate tribal entities. The problem is further compounded by the fact that the first real detailed reports on the Niagara area come from a time of social and political upheaval caused by the expansion of the Five-Nations Iroquois.

The Five-Nations Iroquois expanded in the late 1640's and 1650's. This related to the expanding influence of the European settlers, traders and missionaries and the growth of the fur trade (Hunt 1940). The Five-Nations expanded westward to gain access to new fur-trapping grounds or to trade with other fur-trapping groups. In this, they were blocked by various other Iroquoian-speaking groups as the Huron and the Erie, and to an extent, by the French.

The Neutral may have been one of the groups in the Niagara Frontier in the 17th century. They were primarily located on the Ontario Peninsula west of the Niagara River (Fenton 1940, Hunt 1940, White 1961). However, Houghton (1909: 268) places at least some Neutral villages east of the Niagara River, to which MacNeish (1952: 11) concurs. White (1961: 30) agrees that at least some Neutral may have been in the Buffalo area after 1630. The Neutral were dispersed by the Five-Nations in 1650.

A second group in the area were the Wenro, who have at times been included in with the Neutral Tribe. The Wenro have been placed east of the Niagara River at the village of Ouaronon by Fenton (1940: 178-179) and Houghton (1920: 40). The Wenro probably abandoned the area and moved west in 1638, under pressure from the Seneca (White 1961: 39).

The last group in the area may have been the Erie Nation. These peoples were probably drifting eastward in the early 1600's. The Sanson Map places the Erie in the Buffalo area and south to Cattaraugus Creek prior to 1644-1645. They appear to have moved south from there after 1650, under pressure from the Five-Nations (White 1961: 48-49). The Erie were dispersed by the Five-Nations between 1654 and 1657.

Thus, it appears that several Iroquoian-speaking groups had villages in the general vicinity of Buffalo in the first part of the 17th century. However, these peoples were pushed out by the Five-Nations by 1655, if not earlier.

The vanguard of the Five-Nations expansion to the west were the Seneca. They were apparently in the vicinity of Buffalo by 1655, although there were no major villages located

that far west. In 1669, a small Seneca village was located on a terrace of Cazenovia Creek in West Seneca (Houghton 1920: 44). In 1700, another village was located on Buffalo Creek near what is now Fenton Street in Buffalo (ibid: 44).

During the French and Indian Wars, the Seneca usually sided with the British or remained neutral. However, on at least a few occasions, they sided with the French or attacked the British for their own ends. These incidents included the massacre at Devil's Hole and the ambush of the British near Black Rock on October 19, 1763 (Johnson 1876: 54-55).

Most of the Six-Nations (with the sixth nation being the Tuscorora, added to the Confederacy in 1722) Iroquois sided with the British during the Revolutionary War. In 1779, the Seneca villages in the Genessee Valley were the targets of Sullivan's campaign against the Iroquois. The Seneca and elements of some of the other tribes were driven to the Buffalo Creek area to the support of the British at Fort Niagara. The British encouraged the Iroquois to stay in the area and provided tools, food and seeds (Ketchum 1865: 1-2). With the Seneca, came groups of Onondagas and Cayugas.

In the 1780's, after the end of the Revolutionary War, small groups and families straggled into the Buffalo Creek area. Some groups contained captives taken in raids in western Pennsylvania and Ohio, including the famous Gilbert family. The settlements grew rapidly in size. By the late 1780's many delegations and letters to the Six-Nation Iroquois were sent to the Buffalo Creek area.

#### The Reservation Period:

In 1794, the Treaty of Canandaiga extinguished various Six-Nations' land rights in New York but enlarged the Seneca lands to include Buffalo Creek and the project area (still controlled by the British). Many Iroquois migrated to this area, despite the efforts of the Mohawk chief, Joseph Brant, to entice them to the Grand River settlements which were friendly to the British.

Three years later, in 1797, the Buffalo Creek Reservation was established with the sale of all lands outside of a series of reservations. The lands were included in the Phelps-Gorham and Holland land sales. The Buffalo Creek Reservation, with 130 sq. miles, was the largest reservation and the nearby Tonawanda Reservation had 70 sq. miles, with 15 sq. miles of that in what is now Erie County (Johnson 1876: 93). The other reservations had a total of only 111 sq. miles. The reservation was laid out by August Porter under the direction

of Joseph Ellicott in October, 1798. The original reservation had rather indefinite boundaries (Houghton 1920: 109). The reservation did not include the site of the future village of Buffalo (Fig. 15).

The Buffalo Creek reservation included 83,557 acres in what are now the townships of West Seneca, Elma and Marilla and portions of the townships of Alden, Lancaster, Cheektowaga, Wales, Aurora, Orchard Park, Hamburg, East Buffalo, South Buffalo and Lackawanna (Lankes 1964: 3). The groups present on the reservation consisted primarily of the Seneca, but Big Sky led an Onondaga village on the reservation. The Cayuga were also present on what is now Cayuga Creek and a small number of Delaware (Munsees) were in residence (many of the Munsee eventually migrated to Wisconsin as did some of the Onieda).

In general, the reservation consisted of clusters of log cabins (and eventually some frame houses) and some isolated farmsteads. The cabins were usually one-room structures with a loft for storage. It is likely that the presence of individual structures rather than communal houses may be at least partially explained by the pressures exerted by Euro-American agencies to encourage the growth of individual ownership and family farms.

Some of the major structures associated with the reservation clustered around the area of Buffam, Seneca and Indian Church Roads (Fig. 16). These included a church and the Seneca Mission, which originally stood in the middle of what is now Indian Church Road. It was opened on August 28, 1829 (Lankes 1964: 24). A sawmill was opened at the Gardenville Millrace in 1803, with fittings supplied by the Quakers (ibid: 13). In 1811, a mission was established in what is now South Buffalo. A final structure was the Onondaga Council House on Seneca Road. This structure was important in that it sometimes served as the political center of the Onondaga tribe and hence, the Six-Nations as a whole. There was some debate as to whether the central council fire should reside with the Onondagas who remained on their reservation in Onondaga County or with the Onondagas at Buffalo Creek.

By 1800, the position of the Iroquois on the reservation and in New York in general had declined as had the population. This could be attributed primarily to disease, the effects of alcoholism, the difficulties in obtaining treaty benefits and the pressures caused by the expanding Euro-American population. However, the Iroquois began a social and economic resurgence due to the efforts of the Quakers and similar groups and the effects of the work of Handsome Lake (Wallace 1970). The Quakers supplied secular and vocational education with less empha-

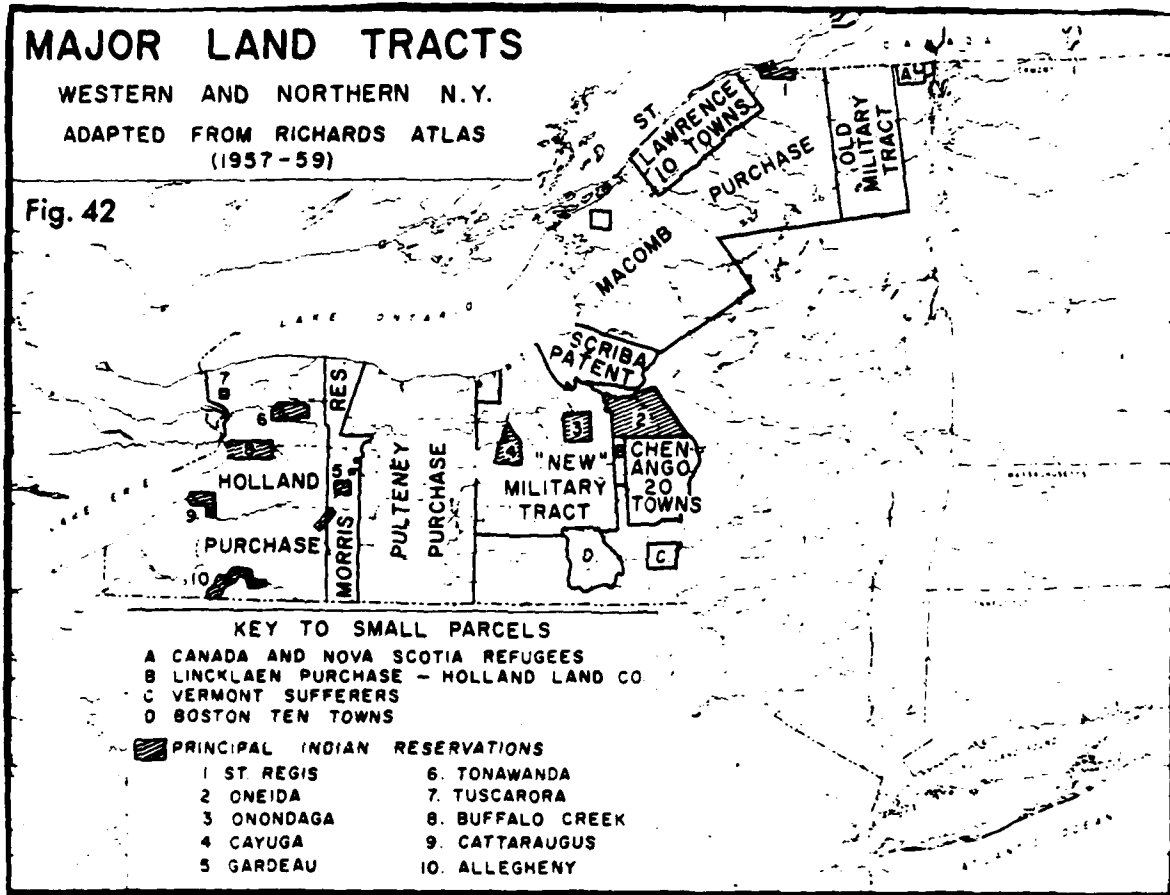


Fig. 15 - The Location of Reservations in Central and Western New York and the Major Land Sales (from Thompson 1966)



sis on religious conversion. They also worked against the alcohol abuse which was rampant. Handsome Lake founded a nativistic movement which rejected damaging elements such as alcohol abuse while encouraging the acceptance of some technological and economic aspects of Euro-American culture. The religion of the Long House, the legacy of Handsome Lake, is still an important support for Native American culture and religion. The Buffalo Creek Reservation became a center for the religion of the Long House and Handsome Lake preached there.

Most of the Iroquois on the Buffalo Creek Reservation remained neutral during the War of 1812, at the request of the United States. However, by 1813, some of the reservation residents distinguished themselves in the defense of the area. On the British side, the Mohawk participated in various raids on the Niagara Frontier and in the burning of Buffalo in 1813.

Almost from the inception of the reservation there was pressure placed on the residents to remove from New York State. It was hoped that they would accept lands in Wisconsin or in the Indian Territories in exchange for their New York lands. In general, the Seneca, lead by such chiefs as Red Jacket, resisted these pressures.

In 1803, some of the small reservations were sold off (Houghton 1920: 157). In 1810, the first movement was taken to acquire the Buffalo Creek Reservation when David A. Ogden got pre-emptive rights to the area (ibid: 159). Five years later, the Seneca sold Squaw, Grand, Strawberry (in the project area), Rattlesnake and Bird islands.

In 1826, there was renewed pressure for land sales. Several more of the smaller reservations were sold. A total of 87,526 acres were lost, including 33,637 acres of the Buffalo Creek Reservation (Lankes 1964: 23).

Pressure for final sale of the reservation continued into the 1830's, but this was generally resisted by the Seneca chiefs. However, a treaty for the sale of the remaining reservation lands was negotiated on December 26, 1838. It was widely recognized that this treaty was achieved by the use of forgeries, the promotion of compliant warriors to chief status, extortion and threats. However, the treaty was brought to the Senate in March, 1840. Arguments related to the methods used to obtain the necessary signatures for the treaty. The final vote on acceptance was a tie. The Vice-President broke the tie by voting in favor of acceptance of the treaty and the dissolution of the reservation (Houghton 1920: 44).

Acceptance of the treaty by the Senate brought considerable criticism from pro-Seneca groups which included supporters in Congress and prominent religious groups. As a result,

the Compromise Treaty of 1842 was accepted. In this treaty, The reservation was given up, but residents had until 1846 to move. Some lands were also returned to the Cattaraugus and Alleghany Reservations. On May 20, 1842, the Ogden Company, which acquired the reservation lands, also acquired the preemptive rights to the Cattaraugus and Alleghany Reservations (ibid: 176).

With the dissolution of the reservation, many of the former residents went to Cattaraugus, although they often returned in following years to visit burial sites and fish in the streams. However, by 1850, the Native American presence in the growing city of Buffalo was basically at an end, except for a few families assimilated into the Euro-American community.

#### The Historic Period (Euro-American)

The Town of Buffalo was established in 1810, the village in 1821. However, the first Europeans penetrated and wrote about the area some 200 years before. The Niagara Frontier in general had an important place in various episodes of American and Canadian history.

#### The French Period - Fig. 17 (ca. 1615-1763)

The French were the first to explore the Niagara Frontier and incorporate it into a colonial entity. Champlain was in Quebec in 1603 and by 1615 had at least heard about the Neutrals, who at that time were either in the vicinity of the Buffalo area, or on the west side of the Niagara (or both). By 1625, the first Jesuits were on the St. Lawrence River and in 1626, Father de La Roche Daillon, a Recollect missionary, visited the Neutrals (Johnson 1876: 24). In 1640, Fathers Brebouef and Cahumont were among the Erie (ibid: 25). It is not known if any of these early explorers landed, or even viewed the future site of the city of Buffalo. The early, less well known voyageurs may have visited the area.

The period between 1650 and 1700 saw a more intensive French effort in this area and Erie County was included in maps of New France. This effort was political and merchantile. There were no French settlements in the area. This was the general pattern of the French occupation of most of New France; traders, missionaries and soldiers explored the area and often established excellent relations with the Native American groups, but they did not settle permanently, except in a few locations.

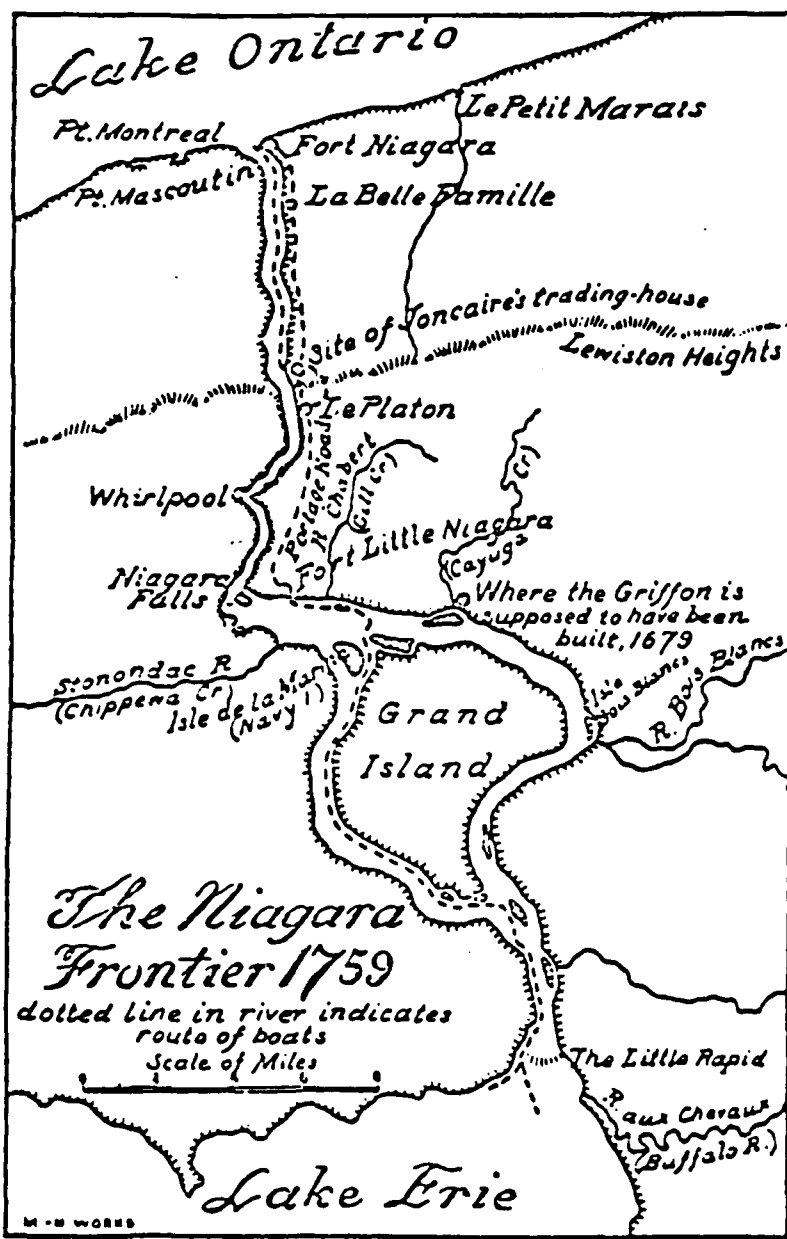


Fig. 17 - Location of Some Sites Relating to the French Occupation of the Niagara Frontier (from Daly and Fuggerio 1982).

One of the motivations behind the increased French interest in the Niagara Frontier was the consolidation of the Five-Nations Confederacy and their expansion to the west at the expense of French trading partners such as the Huron. The French were also concerned about the increasing activities of the British.

In 1678, La Salle selected a site on the east side of the Niagara River to lay the keel for the Griffin, the first ship built on the Great Lakes. Parkman and Marshall have identified the area as just south of Cayuga Creek in the vicinity of the city of Niagara (Johnson 1876: 40). Prior to the launching of the Griffin, Father Hennepin canoed up the Niagara River past the site of Buffalo to assess conditions. He may have been the first European to examine the area (Bingham 1931: 21). The Griffin is cited as having anchored at Squaw Island (ibid: 21).

In 1684, DuLuth and Perrot passed by the Buffalo area on their way to an aborted attack on the Five-Nations. The hostilities between the French and the Five-Nations were the spur for the Marquis de Nonville to erect the first Fort Niagara in 1687, to demonstrate the French possession of the east side of the river. Around the same year, La Hontan suggested that a fort be built near Buffalo Creek, however, his suggestion was not carried through (ibid: 33).

In the 18th century, the Niagara Frontier area became part of the arena for the on-going struggles between the French and the British. In 1725, Fort Niagara was rebuilt and a settlement was made at Lewiston to strengthen the French position. In 1758, Joncaire began construction of a house, barn and workshops at the mouth of Buffalo Creek, and began the cultivation of some lands there (Bingham 1931: 36-37). These buildings were the first beginnings of a settlement in what is now the city of Buffalo. Joncaire obtained the land as a result of his close association with the Seneca. He promoted the settlement as a means of facilitating communication between the western French outposts and Fort Niagara. However, the next year, Fort Niagara fell to the British and Joncaire abandoned his little outpost. In 1763, the treaty ending the French and Indian War extinguished the French title to her northern lands, including those in Erie County.

The French Period in the project area may be summed up much in the same way as in the rest of New France. The French explored and mapped the area and established positive or at least neutral relations with most of the Native American tribes. A fort was built to facilitate trade and demonstrate political sovereignty. However, there were no lasting settlements in the general vicinity of the project area and the French presence can be considered as peripheral.

### The British Period (ca. 1763-1796):

The British controlled the Niagara Frontier for only 33 years. As with the French, they made little use of the area for settlement.

The British claimed the Erie County area in 1620 as part of the Plymouth Colony settlement. The claim was made again when the area was granted to the Duke of York in 1664. The first English visited the general vicinity of the project area in 1686-1687, when Captains Roosebloom and MacGregorie attempted a trading expedition to the Great Lakes. Both men were captured by the French and further British presence in the area was of a surreptitious nature.

As noted earlier, the British took Fort Niagara in 1759 and won formal control of the area with the 1763 treaty ending the French and Indian War. In that same year, a British column was ambushed and destroyed by the Seneca at Devil's Hole on the portage route around the Niagara Falls. Later, on October 19, 1763, a troop convoy was fired upon by the Seneca in the vicinity of Black Rock (Johnson 1876: 54-55). The following year, the British made a treaty with the Seneca. In the treaty, the British began the tradition of reserving the rights to the portage route and a strip along the lakeshore (ibid: 55). In the same year, the name "Buffalo Creek" appeared on a British map of the area, the earliest use of the name on record (Larned 1911: 13). In 1772, Erie County was incorporated into Albany County.

Between 1763 and 1783, there was considerable troop movement through the area. There was also a great deal of interaction between the growing Seneca community at Buffalo Creek and the British settlements and posts across the river. As noted, the British encouraged the Seneca, Cayuga and Onondaga to come to the Buffalo Creek area after their defeat by Sullivan. Letters and embassies sent to the Six-Nations often went to the Buffalo Creek area.

The project area figured little in the American Revolution except in that the Buffalo Creek settlements were an outgrowth of the refugees who fled to the area after 1779. The war also renewed the importance of Fort Niagara.

The Niagara Frontier was ceded to the new American government in the Treaty of Paris in 1783. However, the British remained in control of most of the Niagara Frontier until 1796. Citing the failure by the new American government to live up to some treaty requirements, the British refused to yield up Fort Niagara and other outposts.

In summation, the British made little use of the Niagara Frontier for settlement. Rather, they used it as a buffer

between their Canadian settlements and the Americans to the east. Towards this end, they encouraged the presence of the Six-Nations at the Buffalo Creek settlements.

#### The American Period (Up to 1820):

As noted, the Niagara Frontier was ceded to the new American government in 1783. Control of the area was not completely accomplished until 1796.

The end of the Revolutionary War spurred interest in the rich lands of central and western New York, still nominally owned by the Six-Nations. This resulted in some considerable complexity as to land rights and ownership. Both Massachusetts and New York claimed ownership of the land or pre-emptive rights to acquire it from the Iroquois. In 1784, the Erie County area was incorporated into New York's Montgomery County and five years later into Ontario County. Massachusetts agreed to grant New York State ownership of the one mile strip along the shores of Lakes Ontario and Erie, while retaining pre-emptive rights to the Iroquois lands. In 1788, six million acres were sold to Phelps and Gorham. Phelps secured title from the Seneca on July 5, 1788 at a meeting held at Buffalo Creek (Johnson 1876: 74). Robert Morris acquired the rights to other New York lands from Massachusetts and these were sold to the Holland Land Company in 1792-1793. The Alien Land Act of 1798 allowed the Dutch owners of the company to own the real estate directly (Bingham 1931: 146).

These actions and land sales, along with the Treaty of Canandaigua, provided the basis for extinguishing the Native American land rights (Fig. 15). It opened the central and western New York area to settlement by Euro-American populations.

The early development of this area proceeded very slowly (Fig. 18). The 1790 census of New York indicated that 340,120 people lived in New York (Drescher n.d.: 30-31). Of these, only 24 lived west of the Genessee River.

There were several reasons for this slow development. The first was the continued presence of the British at Fort Niagara and other outposts (including frequent visits to Buffalo Creek). This tended to deflect westward migration to the south along the Alleghany and Ohio Valleys. The presence of large Native American populations with dubious ties to the United States also was an obstacle to migration. Finally, the lack of roads was an impediment, as it was in many other areas of the eastern United States.

The first permanent resident of the Buffalo area was Cornelius Winne (Winney) who settled in as a trader in 1789 (Johnson

# SPREAD OF SETTLEMENT

PATTERNS APPROXIMATED FROM COUNTY HISTORIES, HISTORICAL ATLASES, AND TOPOGRAPHICAL MAPS

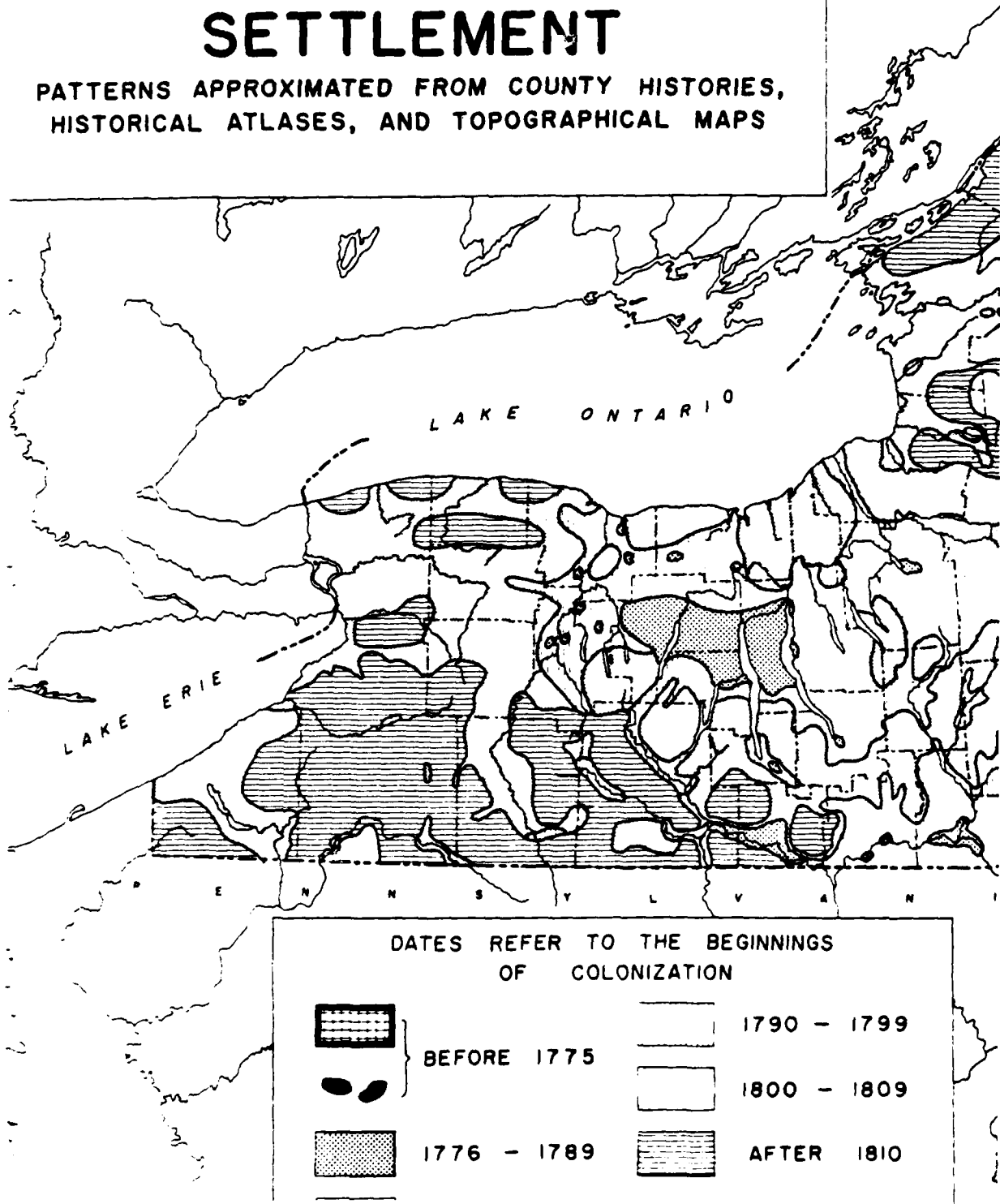


Fig. 15 - Spread of Settlement in Eastern New York (1770-1810)

1876: 84). He was joined in 1792 by Joseph Hodge, an Indian trader. Two years later, William Johnston acquired two sq. miles of land from the Seneca in what is now Buffalo. Johnston was a close friend to the Seneca. He was joined on this land by Ezekiel Lane, his wife and his father-in-law, Martin Mid-  
daugh (ibid: 90). By 1798, Johnston had four buildings and a sawmill on the 685.5 acres he retained after an agreement with the Holland Land Company over land rights. Johnston died in 1807 (Bingham 1931: 133-135).

In 1795, Duke De La Rochefoucauld Lianincourt, a French nobleman, visited the Buffalo Creek area. He noted the presence of four or five houses about 400 meters from the lake-shore. It may be noted that this places the early structures in Buffalo out of the project area.

By the end of the 19th century, immigration to central and western New York was increasing, although the Buffalo area was not to fully participate in the population influx for some years to come. The reasons for the increase in population related to several factors. One was the defeat of the western (Ohio and Indiana) tribes by Wayne and the general increase in security on the western frontier. A second factor was the development of the early roads westward from the Hudson Valley. In 1797, a road from Conewagus (Avon) to Buffalo Creek was authorized. The road followed the well-drained crest of the Onondaga Escarpment and is now part of New York State Highway 5. The following year, a wagon trail was developed from East Transit to the Buffalo area linking the Hudson Valley with Lake Erie (Johnson 1876: 101). A branch of this trail also ran to Black Rock.

Another impetus for migration was the flight from New England which began occurring at this time. Many farmers were leaving the area due to failing farmland and high taxes (Ellis, Frost, Syrett and Carmen 1967: 189). Their movement west provided an impetus to turnpike development in New York. By 1820, it is estimated that 60 to 67% of all New Yorkers had come from New England (ibid: 189). Some of these Yankees also came to central and western New York as speculators. Very few of the early settlers in western New York were from Europe. Those that were came from Great Britain or Holland. The wave of European immigrants did not begin until the 1840's.

The lands around Buffalo, outside of the reservations, were owned primarily by the Holland Land Company. These lands were surveyed in 1797 by Joseph Ellicott and Augustus Porter and divided into townships of six sq. miles. These townships were sub-divided into lots of 120 or 360 acres. The future site of the city of Buffalo was laid out by Ellicott who selected the site and got William Johnston to help influence the

Seneca to exclude the town site from the reservation. The original name of the settlement was to be Lake Erie, but this was dropped in favor of Buffalo Creek, which was in turn dropped for New Amsterdam.

The Holland Land Company offered to sell land cheaply to tavern owners on the East Transit-Buffalo line as a method of attracting travellers and settlers along the road. One of these was Asa Ransom, who opened one in Clarence Hollow (Johnson 1876: 101). Ransom became the first justice of the peace in December, 1801 (ibid: 107). The first major land sale of 234 acres was made to Christopher Sadler for land in Clarence Hollow on March 12, 1801 (ibid: 105).

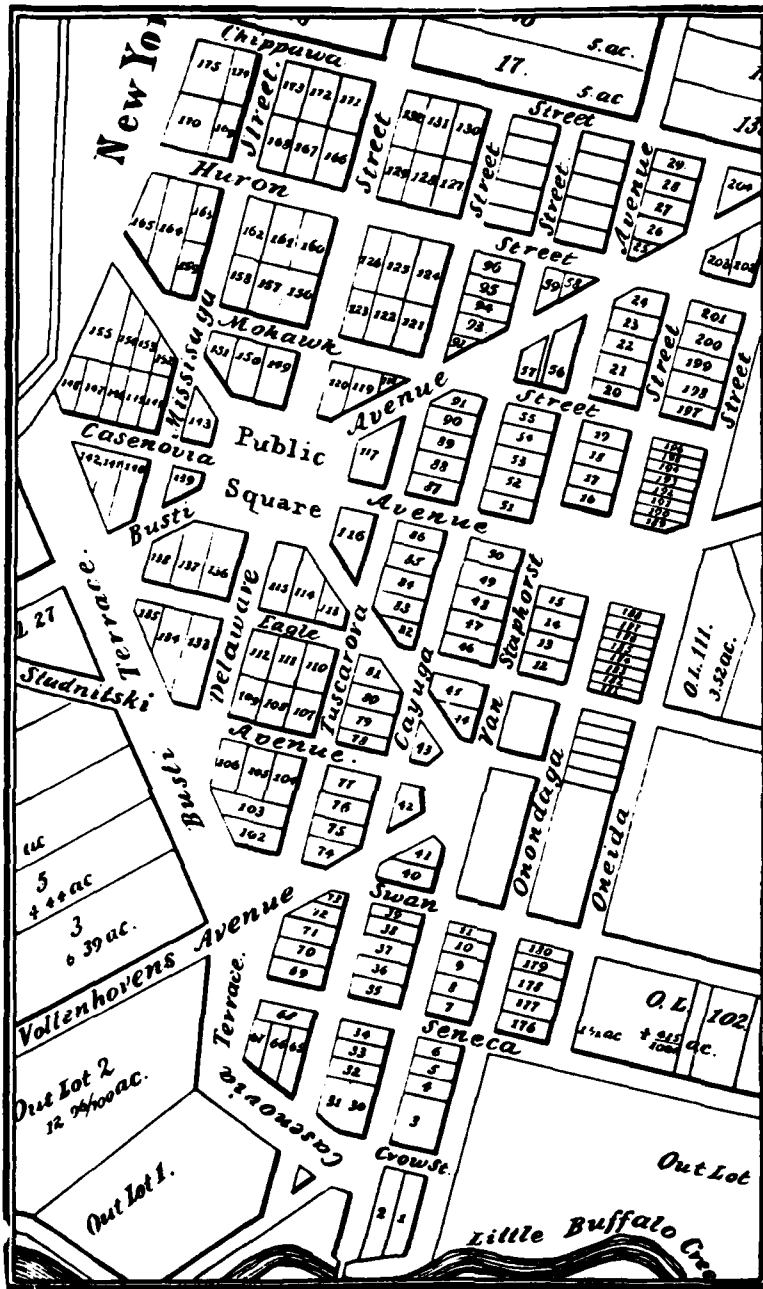
The village of New Amsterdam developed very slowly. It was laid out by Ellicott in 1802 and 1803 (Figs. 19-20). It is interesting to note that Ellicott aided his brother in laying out the site of the national capitol and this may explain some of the features of the new village. Ellicott laid out commercial inner lots and suburban outer lots. He reserved Outer Lot 104 for himself.

The settlers who came to the village in 1804 included such future prominent citizens as Samuel Pratt, William Johnston, Maybee, Phelps, McConnell, Robbins, Chapin (first physician), and Crow (Smith 1884: 32). In the same year, the first post office was set up for "Buffalo Creek." Even at that time, the name "New Amsterdam" was not popular. By the end of 1804, there were 14 property owners in the new village. They were joined in 1805 by five more and six more in 1806.

The land including Erie County was split off from Onondaga County to form Niagara County in 1807. The following year, Buffalo became the county seat. The Town of Buffalo was established in 1810 and the name "New Amsterdam" was officially dropped. The origin of the name "Buffalo" probably comes from the occasional presence of bison in the area up to historic times (Beauchamp 1907: 59-61).

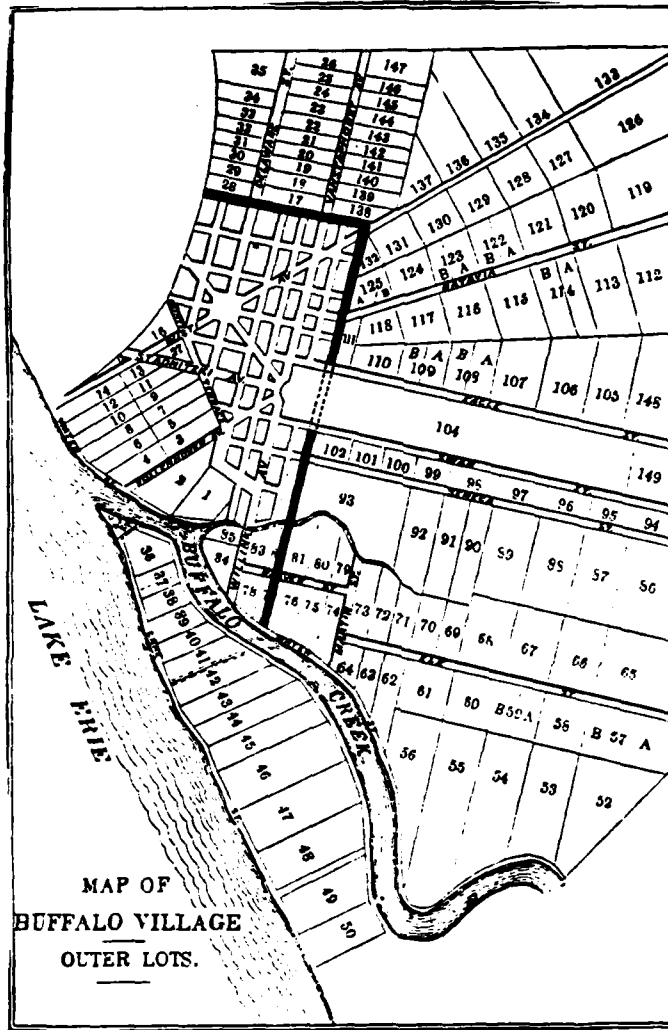
In 1811, the growing town of Buffalo had about 100 houses, three taverns, a jail, an unfinished courthouse, a schoolhouse, a meeting house, a newspaper (the Buffalo Gazette), a hat factory, a brick hotel and a variety of small stores (Johnson 1876: 193-194, Larned 1911: 22). These structures housed a population of over 400 residents. The progress of the town was to be soon halted by the events of the next several years.

During the War of 1812, the Niagara Frontier was the scene of many skirmishes and battles and was a staging area for both sides for troop and supply movements. Several batteries were placed at Black Rock and a navy shipyard was hastily set up on the south bank of Sajaquada Creek, east of the present bridge. Some of Perry's fleet was outfitted there (Babcock 1927: 21).



INNER LOTS  
Village of Buffalo (New Amsterdam) 1804

Fig. 12 - The Inner Lots in the Village of New Amsterdam - 1804  
(from Smith 1990)



OUTER LOTS  
Village of Buffalo (New Amsterdam) 1804

Fig. 20 - The Outer Lots in the Village of New Amsterdam - 1804  
(From Smith 1884)

Buffalo was a staging point for several largely unsuccessful American forays into Ontario. These included an assault on Fort George and Queenston Heights in October, 1812. On July 11, 1813, the British attempt to march on Buffalo from a landing site at Black Rock was repulsed by a small but determined force of soldiers, militia and Seneca. Later that year, on December 29th and 30th, the British were successful in burning almost all of the structures in the settlements of Black Rock and Buffalo. Only a few buildings survived. The British returned to burn several more on January 1, 1814 (Babcock 1927: 135).

One other interesting event which occurred in Buffalo during the war also caused damage to the village. This was a riot between American troops and local townspeople. Although the riot was quelled, it left a legacy of bad feeling between the troops and the townspeople and there was some talk that the regular troops did not exert their full efforts to defend the village when the British and their Native American allies burned it and killed a number of citizens.

The reconstruction of Buffalo began shortly after its destruction and was well advanced by the end of the war in 1815. Aid to the stricken town included \$40,000 voted by the New York State legislature, \$3,000 from the city of New York and \$1,000 from the city of Albany.

The period between the end of the war in 1815 and the beginning of the Canal Period in 1825, saw considerable growth in the Buffalo community. The village was incorporated on April 5, 1816 and a county courthouse was built. Population rose from around 400 in 1811 to 2095 in 1820. This growth could be attributed to the end of the war and the continued pacification of the western tribes. It also related to the acceleration of the immigration of New Englanders into central and western New York, seeking farmlands to grow wheat. Another factor was the slow but steady rise in lake shipping from the west.

With the end of hostilities there was an increase in American shipping on the Great Lakes. Sloops, schooners and open boats landed at Black Rock and Buffalo, although the latter site was hampered by the lack of an adequate harbor (Johnson 1876: 296). Products going up river included whisky, dry-goods, household goods, naval stores, groceries, hardware, salt, fish, spirits, medicines, farm utensils, tea and coffee. Commodities going downstream included furs, fish, cider, furniture, paint, building stone, crockery, pork and clothing (Johnson 1876: 301).

The major event in the development of Buffalo in the early 19th century was the beginning of the building of the Erie Canal. The canal was advocated by Jesse Hawley in 1807-1808. In 1812, the New York State legislature approved the funds for a canal but the plan was shelved due to the start of the war. Five

years later, the bill for the canal was passed again and work commenced in the city of Rome on July 4, 1817. The next section of this report will discuss the effects of the construction of the canal on the growth of Buffalo and its harbor. The harbor improvements were done to help attract the terminus of the canal to Buffalo over its rival, Black Rock. The initial harbor work was completed in 1821 and Buffalo was awarded the terminus of the canal in 1823. Construction began in Erie County on August 9, 1823 and the canal was opened on October 26, 1825.

In summation, the period between 1783 and 1825 saw very slow development for the Buffalo area. This related to several factors effecting the Niagara Frontier as a whole and to much of the western frontier in general. The inhibiting factors included the unsettled political situation with the British, the presence of potentially hostile Native American groups, the lack of adequate transportation for people and commodities and the sometimes confusing welter of land titles. These problems were largely surmounted by the 1820's and with the influx of immigrants from New England, and later Europe, and the completion of the canal, the basis was set for the rapid development of the city of Buffalo.

#### The American Period 1820-1860:

The completion of the Erie Canal in 1825 inaugurated a century of development in the Buffalo area (Fig. 21). Population and trade expansion resulted from the favorable location of the area as a transshipment point connecting the Atlantic Ocean and the eastern Great Lakes. Immigrants and manufactured goods travelled westward across New York from the Atlantic coast while grain and other raw materials, especially wheat, flowed eastward from the farmlands of the Midwest (Report U.S. Engineers, 1841: 189). Buffalo grew from a village of 2412 inhabitants in 1825 to 8653 in 1830. Buffalo was incorporated as a city in 1832 with a population of 10,000 people. After Buffalo annexed the village of Black Rock in 1854, population reached 74,938 peoples (Ball 1879: 150, Barrick 1970: 14, City Surveyor 1980). As with many other cities in the eastern United States, Buffalo benefited from the tide of European immigrants which began to flood the country in the 1840's. Many of these individuals fled the political upheavals of that decade while others left for economic or religious reasons. Many of Buffalo's ethnic communities trace their beginnings to the 1840's.

The growth of Buffalo was triggered by the Erie Canal and

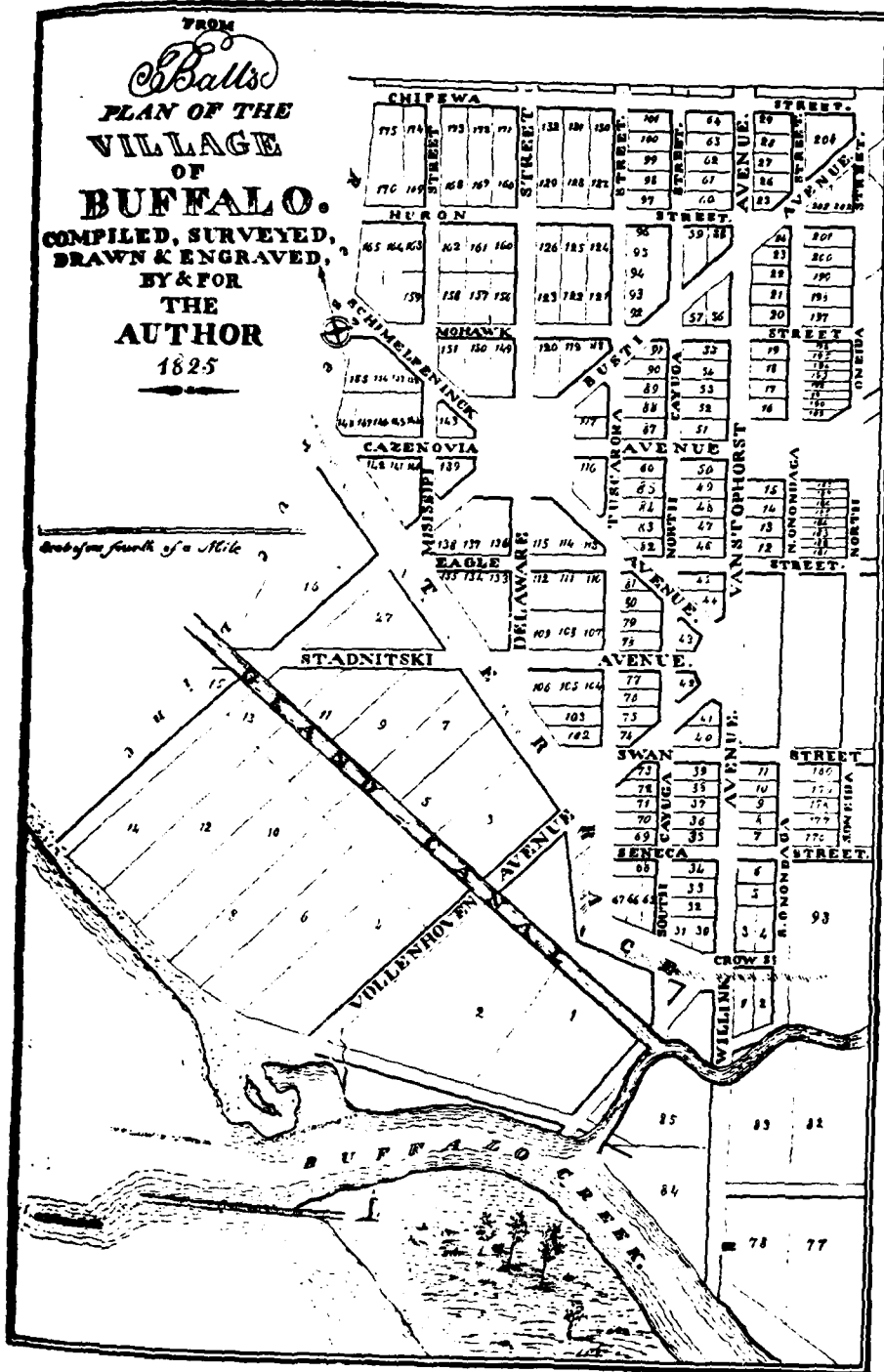


Fig. 21 - Buffalo in 1825 (from Ball's Plan)

sustained by a series of improvements to its harbor facilities which provided essential services to waterborne commerce. These developments did not occur without competition from rivals, especially from shipping interests centered in Black Rock, a village of about 2,000 inhabitants in 1836. The village was located north of Buffalo on the Niagara River. Black Rock had a long-standing lead in developing a harbor. Indeed, it had a number of advantages when compared to Buffalo as a terminus point for the Erie Canal. The large black rock, from which the community derived its name, sloped gently towards the river thereby providing a natural dock and loading ramp for the small vessels plying the Niagara River north and south to Lake Erie. Boatyards and mills sprang up, especially near Scajaquada Creek. New York State designated Black Rock as a port of entry for nine months of the year in 1811, taking this advantage away from the village of Buffalo. Perry constructed warships at Black Rock during the War of 1812 and a military base was established there after the war. In 1817, the first steamship on the Great Lakes, the Walk-on-the-Water, was home ported at Black Rock. General Peter B. Porter became the spokesman for the community, as well as its leading merchant and landholder. Porter's influence as a member of the New York State Canal Commission also contributed to Black Rock's case to be the western terminus for the Erie Canal (Hill 1923: 199, Naçle 1955: 1).

Black Rock's sheltered natural harbor enabled it to dominate the river trade (Rapp 1947: 5). As a competitive move against Buffalo, which had a larger population, the citizens of Black Rock began enlarging their harbor in 1822 with the approval of the state authorities. The following year, engineer James Geddes designed the harbor which included the construction of a long breakwater or "traverse pier" from Bird Island to the southern end of Squaw Island, thereby protecting the enlarged harbor area from western storms. A towpath was added as were other improvements. A total of \$41,410 was expended on the project (Black Rock Harbor Papers, Severance 1910: 312-313, 364, Hill 1923: 200, Emslie 1847 Map).

The Bird Island Pier and Black Rock Harbor developments could not overcome some of the environmental drawbacks of the Black Rock site. The current of the Niagara River forced ships to utilize oxen to tow them downstream towards the more populated village of Buffalo. Shoals and rapid currents within the new harbor also detracted from its utility, as did the debris which accumulated from the Buffalo River as it began to be improved (House Executive Document #23 1848: 7, Hill 1923: 264).

Despite the obvious drawbacks, improvements to the Black Rock harbor and the Bird Island Pier continued. In 1824, New York State appropriated funds to construct a lock and dam at

what is now Bridge Street. In 1829, the Federal Government assumed control of the Black Rock Harbor. Funds were allocated for a 244 meter extension of the Bird Island Pier and a bridge at Ferry Street. The Black Rock Ferry connected New York with Fort Erie, Ontario (Norton 1879: 91-109, The Port of Buffalo 1951: 7-8). The Bird Island Pier extension was completed in the 1830's, making the entire work about 1220 meters in length as seen in Fig. 22 (Report U.S. Engineer 1830: 93, Report Chief Engineer 1886: 2028-2034). Work continued on the Bird Island Pier and the Black Rock Harbor until 1834. In the following year, a plan to extend the Bird Island Pier southeastward towards the mouth of the Buffalo River was rejected (House Executive Document #23 1848: 7, Report Chief Engineer 1886: 2028-2034). The focus of waterfront activity by that date had shifted in favor of the developing Buffalo Harbor. Between 1834 and 1906, Federally supported work ceased at Black Rock (Report Chief Engineer 1835: 131-132, Report Chief Engineer 1915: 1970).

The development of the Buffalo Harbor is a success story in American commerce and in the history of Corps of Engineer contributions to the public. Prior to 1818, the entrance to Buffalo River was partially blocked by a sand bar. At times of low water levels people could walk across the 60 meter wide mouth of the river (Report U.S. Engineer 1841: 190-192, Ball 1879: 148, Wilkeson 1902: 187). In 1818, William Peacock attempted to improve the mouth of the Buffalo River but was only partially successful. In the following year, the State of New York encouraged private citizens to undertake further developments which would deepen the entrance of Buffalo River where it flowed into Lake Erie. Judge Samuel Wilkeson led the prodigious effort to improve the river mouth (Report U.S. Engineer 1841: 192, Report of U.S. Engineer 1867: 224-225, Wilkeson 1902: 189). The Buffalo River joined Lake Erie at an ill-defined point along an alluvial swamp parallel to the lake (Rapp 1947: 44). Wilkeson cut a channel slightly south of the existing mouth and altered the river's course by erecting two piers. The re-directed force of the water scoured a new mouth.

By 1820, the South Pier extended 400 meters into Lake Erie (Fig. 23) and the North Pier, made of sheet piling, ran out about 300 meters (Barrick 1970: 7, Drescher n.d.: 78-79). The resulting channel could handle the largest ships of the time, including the steamers and had a 2.4 meter depth for a distance of 1.6 kilometers upstream. It led into the area that became the city of Buffalo (Report U.S. Engineer 1841: 190-192). By 1821, a "primitive stone lighthouse" was erected on the South Pier (Symons and Quintus 1902: 244-245).

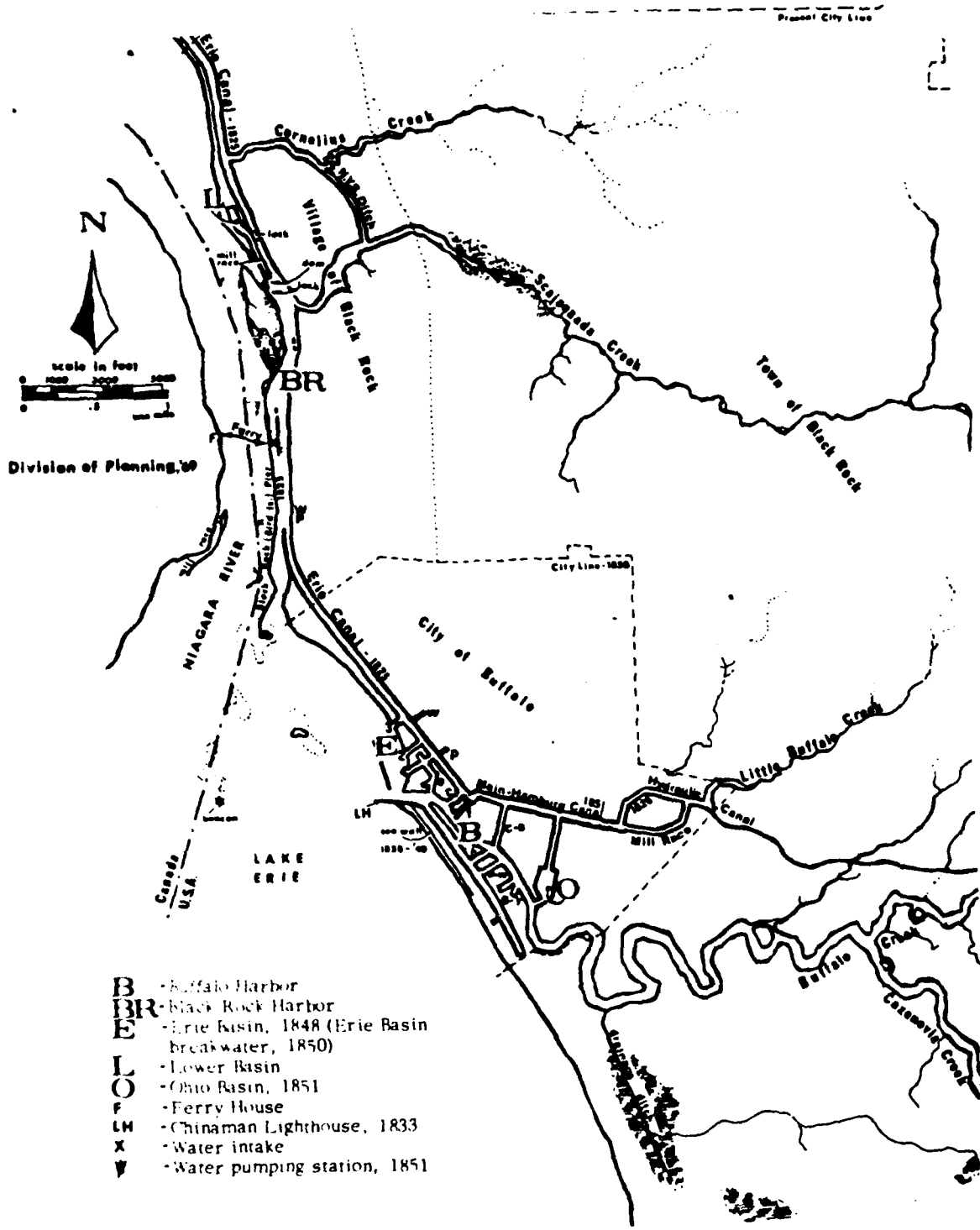


Fig. 22 - The Location of Bird Islands as Shown by Arrows (Map from Barriek 1970)

**1804**

- (A) Buffalo Creek - navigable for canoes and batteux only, due to sand bar at mouth
- (B) Little Buffalo Creek - Rose near present intersection of Bailey and Broadway

**1820**

- (A) Buffalo Creek - Now navigable for largest ships of time, due to improvements by Wilkeson and others.
- (B) Little Buffalo Creek
- (C) Sheet piling - Intended to deflect flow of Creek so as to wash away sand bar at its mouth
- (D) South Pier - Built 1820 - still standing

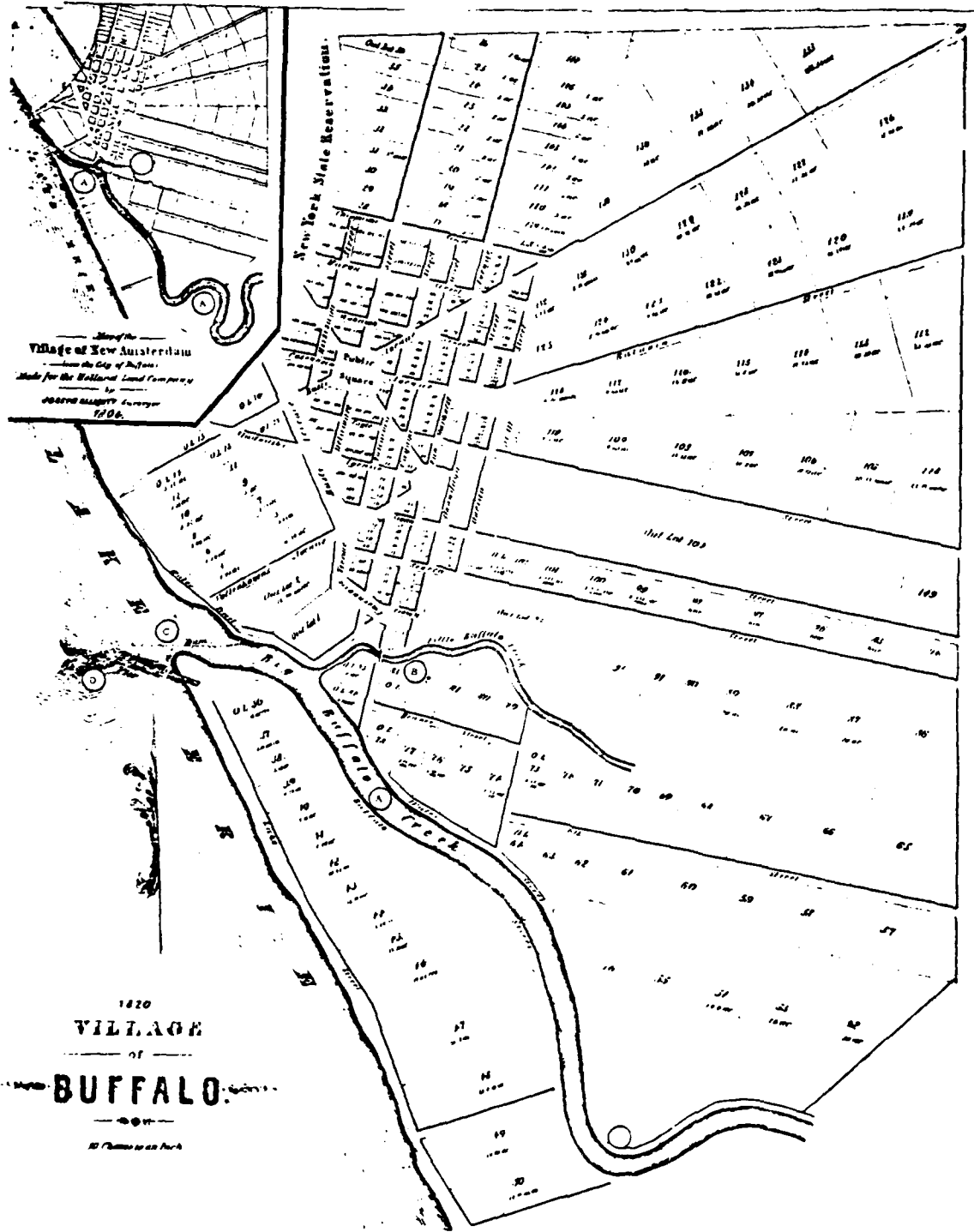


Fig. 23 - Early Developments in the Buffalo Harbor (from Baxter and Hays, 1945).

**1825**

- |     |   |   |
|-----|---|---|
| (A) | Buffalo Creek   | VOLLENHOVEN AVE. now ERIE STREET                              |
| (B) | Little Buffalo Creek  | WILLINK AVE. now MAIN STREET,<br>south of Shelton Square      |
| (C) | Sheet Piling to deflect current<br>of Buffalo Creek and Scour Sand<br>Bar   | VANSTOPHORST AVE. now MAIN STREET,<br>north of Shelton Square |
| (D) | South Pier  | BUSTI AVE. now GENESEE STREET                                 |
| (E) | 1st Lighthouse  | STADNITSKI AVE. now CHURCH STREET                             |
| (F) | Erie Canal - Completed 1825 -<br>Connected to Buffalo Creek by<br>Little Buffalo Creek - Connection<br>later became known as Prime Slip |   |

New York Figure 24

*Bull's*  
 PLAN OF THE  
 VILLAGE  
 OF  
**BUFFALO.**  
 COMPILED, SURVEYED,  
 DRAWN & ENGRAVED,  
 BY & FOR  
 THE  
 AUTHOR  
 1825

*Scale your fourth of a Mile*

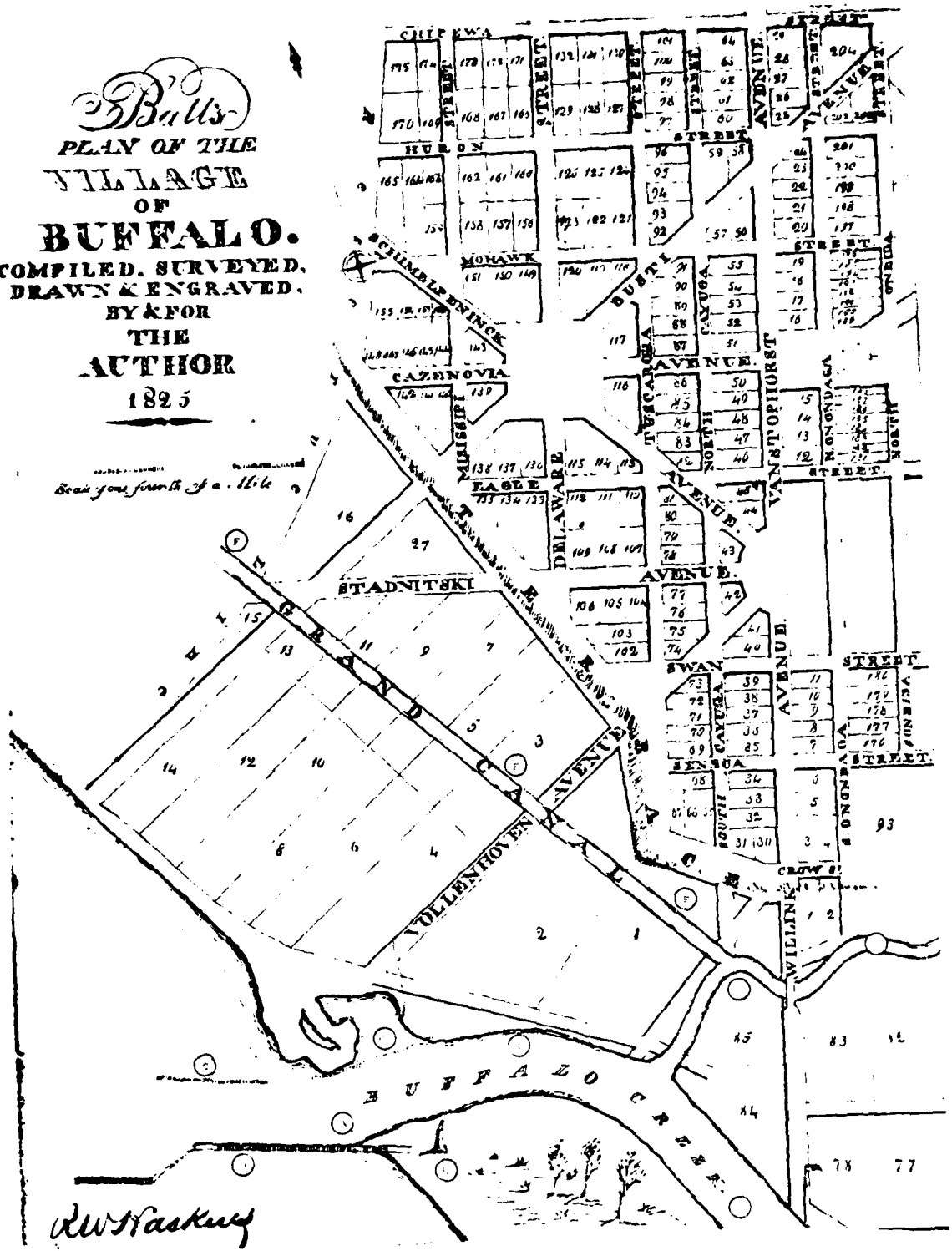


Fig. 1. - Developments in Buffalo Harbor Around 1825  
 (from Baxter and Heyl, 1965).

These improvements placed Buffalo in a favorable position to compete with Black Rock in obtaining the western terminus of the Erie Canal. Most importantly, the water level at the Buffalo River and Lake Erie was higher than that of the Niagara River. By selecting Buffalo over Black Rock, extensive locks and dams would not be necessary as the canal progressed further east (Barrick 1970: 8). For various reasons, Buffalo was selected as the western terminus of the canal.

In 1825, the Erie Canal joined the Black Rock Channel (Fig. 24) at the 1824 dike and flowed into Buffalo River at its juncture with the Little Buffalo Creek, near what is today, Erie Street (Baxter and Heyl 1965: 33, Barrick 1970: 9). These developments occurred without making use of the Bird Island Pier or the upper part of Black Rock Harbor. The distinctive black rock was blown up during canal construction. Water level changes caused the inundation of Bird Island and transformed the forested low lying areas of Squaw Island into swampland, which may have impacted prehistoric resources there (Barrick 1970: 8). Black Rock shrank in importance although milling continued in the area. The village was absorbed by Buffalo in 1854 (Black Rock Chronicle n.d.: 2).

Transportation costs declined rapidly as goods, people and raw materials flowed into and out of Buffalo (Drescher n.d.: 68-69). Buffalo's importance for the next 100 years was assured. Shipping increased tremendously. In 1821, only 150 vessels arrived and departed from Buffalo. By 1828, 1520 ships called on the harbor. Four years later, 2560 vessels arrived and departed and the figure reached 4061 in 1840 as seen in Table #1.

Control of the harbor passed to the Federal Government in 1826 and work immediately began on improving both the North and South Piers, especially after a severe storm in 1828 (Report U.S. Engineer 1841: 190-192, Symons and Quintus 1902: 244-245, Drescher n.d.: 80-81).

Army engineers strengthened, lengthened and straightened the South Pier (now called the U.S. South Pier or Lighthouse Pier). The 546 meter long work was rapidly complete, although numerous repairs were carried out through 1839. A tall, "hard-some cut stone lighthouse" was erected on the swelled lake end in 1833 (Fig. 25). The structure became known as the Buffalo Light, or Chinamen's Light and still exists, although much modified (Symons and Quintus 1902: 245-247, 284). The North Pier also grew, extending 3801 meters into the lake by 1834. Army engineers also deepened the mouth of the Buffalo River to a three meter depth (Report U.S. Engineer 1867: 224-225, Symons and Quintus 1902: 246, Barrick 1970: 13).

The scale, as well as the volume, of trade and waterborne traffic at Buffalo required an expansion of docks along with

# 1836

- |   |   |
|---|---|
| (A) Buffalo Creek - Channel depth 10 feet   | (I) Commercial Slip   |
| (af) Showing up-stream is dam and hydraulic work constructed 1826 which supplied mills located east of Exchange and Hamburg Sts. and also later on Hydraulic St. Hydraulic St. race still passes beneath Larkin Warehouse. Additional water was obtained by damming Buffalo Creek near Harlem Road and carrying water by Canal to Little Buffalo Creek. | (J) Prime Slip  |
| (D) South Pier  | (K) Proposed Main & Hamburg Canal (not built until 1848-51) |
| (E) 1st Lighthouse  | (L) Clark & Skinner Canal                                   |
| (F) Erie Canal  | (M) Proposed Ohio Slip - Built 1848-9                       |
| (G) 2nd Lighthouse - Built 1833 - "Chinaman Light"  | (N) Proposed South Channel - Never built                    |
| (H) Evans Ship Canal - Privately owned  | (O) Peacocks Slip   |
|   | (P) Wilkeson Slip   |
|   | (Q) Marine Railway - Site of Shipyard until 1964            |

Key to Figure 20

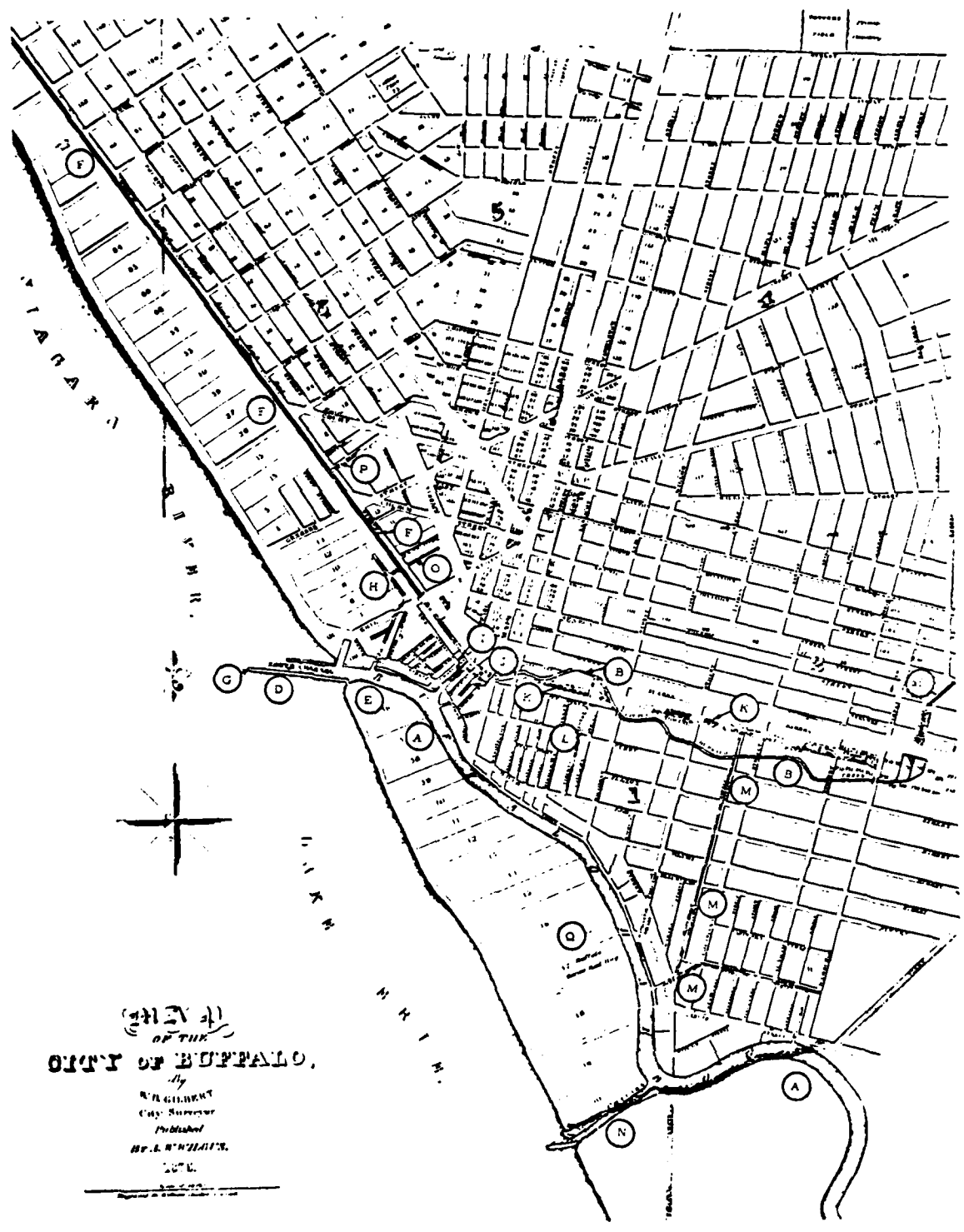


Fig. 11 - Developments in the Buffalo Harbor Around 1836  
 (from Baxter and Heyl 1965)

*Statement.*

| Year. | Arrivals and de-<br>partures of steam-<br>boats and vessels. | Clearances. | Tolls.   | Amount expended<br>eastward by can-<br>nal. | Amount received by<br>canal and shipped<br>to the west. |
|-------|--|-------------|----------|---|---|
| 1815  | 64   |             |          |   |   |
| 1816  | 100  |             |          |   |   |
| 1817  | 109  |             |          |   |   |
| 1818  | 106  |             |          |   |   |
| 1819  | 96   |             |          |   |   |
| 1820  | 126  |             |          |   |   |
| 1821  | 153  |             |          |   |   |
| 1822  | 205  |             |          |   |   |
| 1823  | 233  |             |          |   |   |
| 1824  | 278  |             |          |   |   |
| 1825  | 369  |             |          |   |   |
| 1826  | 478  | 1,160       | \$19,558 | 5,134 tons.                                 |   |
| 1827  | 972  | 1,426       | 26,293   | 8,621 "                                     |   |
| 1828  | 1,520  | 1,880       | 32,123   |   |   |
| 1829  | 1,896  | 1,599       | 25,923   |   |   |
| 1830  | 2,032  | 2,066       | 49,923   |   |   |
| 1831  | 2,227  | 2,421       | 65,989   |   |   |
| 1832  | 2,763  | 2,220       | 58,136   |   |   |
| 1833  | 3,739  | 2,772       | 73,695   | --  | 18,595 tons.  |
| 1834  | 2,975  | 4,008       | 91,018   | --  | 21,450 "  |
| 1835  | 3,280  | 5,175       | 105,863  | 32,421 tons.                                | 23,140 "  |
| 1836  | 3,859  | 5,018       | 157,536  | 45,052 "                                    | 35,809 "  |
| 1837  | 5,058  | 4,755       | 128,581  | 44,157 "                                    | 27,567 "  |
| 1838  | 5,003  | 4,970       | 202,890  | 76,458 "                                    | 35,586 "  |
| 1839  | 5,125  | 5,013       | 259,183  | 156,161 "                                   | 31,887 "  |
| 1840  | 4,871  | 4,851       | 376,417  | 177,607 "                                   | 20,463 "  |

Table #1 - Volume of Vessel Traffic in the Buffalo Harbor,  
1815-1840 (Report of U.S. Engineers, 1841).

the warehouses, grain storage facilities and related structures. Private and municipal improvements took place in the years prior to the Civil War. Although none of the improvements are located within the project area under review, a brief summary of their development is necessary to provide a balanced overview and historical perspective for the discussion of the waterfront as a whole.

Between 1844 and 1854, the shipping-related facilities within Buffalo Harbor (that area east of the mouth of the Buffalo River and Lake Erie and called the Inner Harbor) doubled. Increased space became available by the construction of additional canals, basins and slips which were connected to the Erie Canal. They were also connected to the Buffalo River, the mouth of which was Federally administered (Fig. 26). Eventually, 27 kilometers of artificial inland waterways came into being (Barrick 1970: 18). The Buffalo Board of Trade promoted the development of the Inner Harbor. The works included the Main-Hamburg Canal (1852), the Erie and Ohio Basins and connecting slips (1848-1856), the Evans Ship Canal (1831-1834), the Coit Slip (1830's), the City (Blackwell) Canal (1847-1850) widened in 1873 and extended in 1883 southward through the Tiffit Farm (Graham and Severance 1945: 40-41). Other works included the Commercial Slip (1825), the Prime Slip, Clark and Skinner canals (1843), Peacock's Basin (1836), Wilkeson Slip (1836), Hatch Slip (1848) and the Kinne and Wadhams slips (1848). The Inner Harbor was thus an imposing facility as seen in Fig. 26 (Baxter and Heyl 1965: 16).

State authorities contributed to the protection and development of the Buffalo Harbor by constructing a 627 meter long breakwater known as the New York State Breakwater, north of North Pier. Completed during the late 1850's, and later enlarged, the State Breakwater had three finger piers located on its eastern face by 1866 and fronted the Erie Basin. Around the same time, Peacock's Slip was extended (1850) and Palmers Slip (1866), Erie Slip No. 2 (1850) and the Niagara Slip No. 3 (1850) were constructed. Along with the Coit Slip, these works formed the functioning heart of the Erie Basin which ran northward from Erie Street to Wilkeson Street (Jewett 1852 Map, State Engineer Map of 1855, Canal Commission Map, Symons and Quintus 1902: 261, Rapp 1947: 57, Baxter and Heyl 1965: 18-21, Barrick 1970: 15). The Federal Government constructed the Horseshoe Reef Lighthouse in 1856 and assisted navigation by marking the dangerous reef and the approach to the Erie Basin (Symons and Quintus 1902: 284).

Trade boomed in the growing city of Buffalo. The transportation of cereals, particularly wheat, became the most important source of wealth in Buffalo's history. In 1840, four million bushels of wheat were shipped to Buffalo. This increased

# 1848

- |   |  |
|---|--|
| (A) Buffalo Creek   | (M) Ohio Slip - Under construction<br>complete 1850    |
| (B) Little Buffalo Creek - Soon<br>to be by-passed by Hamburg<br>Canal        | (N) Proposed South Channel -<br>never built            |
| (D) South Pier  | (O) Peacocks Basin                                     |
| (E) 1st Lighthouse  | (P) Wilkeson Slip                                      |
| (F) Erie Canal  | (Q) Shipyard - Dry dock has been<br>added              |
| (G) 1833 Lighthouse   | (R) Ohio Basin - Under construction<br>- complete 1851 |
| (H) Evans Ship Canal - Dart's<br>steam powered elevator<br>built here in 1842 | (S) Erie Basin - Under construction                    |
| (I) Commercial Slip   | (T) Sea Wall   |
| (J) Prime Slip  | (U) Hatch Slip - (On the "Island")                     |
| (K) Main & Hamburg Canal - under<br>construction - complete 1851              | (V) Kinne & Wadhams Slip (On the<br>"Island")          |
| (L) Clark & Skinner Canal   | (W) Proposed City Ship<br>(E. R. Blackwell) Canal      |

Map of Figure 26



Fig. 26 - Developments in the Buffalo Harbor Around 1848 (from Baxter and Heyl 1965)

to ten million bushels in 1850 and this tripled by 1860 (Drescher n.d.: 294-295, Barrick 1970: 21). Joseph Dart constructed the first steam-operated grain elevator in the world in 1842 at the Evans Ship Canal and additional elevators sprang up as well (Dart 1879: 391-404, Baxter and Heyl 1965: 16-19).

To increase the security of the Inner Harbor with its crowded facilities and thousands of vessels, the U.S. Army Engineers recommended constructing a sea wall along the eastern margins of Buffalo's waterfront, extending southward from South Pier for 2.4 kilometers through the low swampy ground that is now Fuhrmann Boulevard. A severe storm in 1836 caused great damage to the ships and docks in the Inner Harbor. About 100 meters of sea wall had already been constructed to protect the old lighthouse in 1830 and in 1838, additional Federal appropriations became available. After 1150 meters of "earth mound with masonry facing" had been constructed, a violent storm in 1844 destroyed all but 450 meters of the work (Drescher n.d.: 87-88, Report U.S. Engineer 1881: 2420-2421, Report U.S. Engineer 1886: 2028-2034, Report U.S. Engineer 1896: 3110, Symons and Quintus 1902: 252-254, Bingham 1931: 466, Barrick 1970: 14). A proposed additional channel into the Buffalo River, known as the "South Channel" was recommended but not undertaken (Symons and Quintus 1902: 253).

During the 1850's, significant changes taking place in the United States began affecting Buffalo and the importance of both the Erie Canal and the Inner Harbor. First came the development and improvement of railroads which laid tracks parallel to the route of the Erie Canal. The railroads proved to be strong competition for the trade carried by the canal boats. Next came the growth in size, speed and type of propulsion used by lake freighters. Finally, the sectional controversy between the North and South had the effect of curtailing Federal appropriations for internal improvements.

The increasing size of lake freighters began straining the capacity of the Inner Harbor with its narrow physical limitations (Rapp 1947: 46). The largest number of vessels used the harbor in 1862, when 16,390 ships of all types cleared Buffalo. Thereafter, the number of vessels decreased, but their overall tonnage increased (Barrick 1970: 18).

Army engineers were aware of the trend towards increased size of lake freighters well before the Civil War. Between 1844 and 1849, two plans were proposed to deal with the problem associated with the narrow configuration of the Inner Harbor. Both involved creating more ample harbor space outside of the Buffalo River and both plans included extensive construction projects. One plan involved building a breakwater northward,

a short distance west of the U.S. South Pier, perhaps connecting with, or including an extension from Bird Island Pier. The northern project was supported by local Black Rock and Erie Canal interests. The New York State Breakwater was a physical manifestation of the influence of that particular group of individuals (Emslie Map of 1847, Symons and Quintus 1902: 261). The U.S. Engineers favored a plan to create a harbor south of South Pier, where conditions were more favorable for the development of a large artificial harbor and breakwaters (House Executive Document No.23 1848-1849: 2), by building a 1980 meter long breakwater and an Outer Harbor to the south. Moreover, there would be no need to complete the sea wall on Buffalo's southern shoreline because the violent action of Lake Erie would be partially restrained by the calm waters of the resulting harbor (Kearny 1845 Map, Report U.S. Engineer 1881: 2420-2421). The U.S. Board of Engineers approved the southern harbor plan in 1845 (Report of U.S. Engineer 1886: 2028-2034).

Growing sectional animosity brought an end to Federal projects. Between 1853 and 1864, no appropriations for harbor improvement were authorized for Buffalo (Report U.S. Engineer 1881: 2420-2421). Work did not begin on proposed projects until after the Civil War.

New York State removed its legal restrictions on the competition of railroads with the Erie Canal in 1851. Before long, a number of lines served Buffalo. The New York Central Railroad arrived in Buffalo in 1853. The Grand Trunk Railroad consolidated the holdings of several independent lines in Buffalo during 1862. By 1869, railroad freight tonnage exceeded that of the Erie Canal. Buffalo became a major rail center and eventually, over 700 kilometers of tracks were laid within the city limits. Railroads displaced the Central Wharf and controlled extensive property holdings along the south Buffalo waterfront, including most of the acreage fronting the proposed Outer Harbor (Drescher n.d.: 154, Waterfront Map 1866, Rapp 1947: 36-37, Barrick 1970: 18, Daly and Ruggerio 1982: 42). The railroads brought important physical changes to Buffalo's environment. The most significant of which involved the creation of extensive corridors, yards, facilities and tracks near the center of waterborne commerce and the virtual monopolization of the future shores of the Outer Harbor. By the mid-1880's for example, the Delaware, Lackawanna and Western created a rail corridor west of the Erie Canal along Water Street (Rapp 1947: 271-273).

The American Period 1860-1930's:

The War Between the States affected Buffalo's citizens as it did most other Americans. Young men volunteered for military service. Many never returned or were injured in the conflict. The size of the available labor force shrank. The city's harbor and shipping facilities contributed to the Union victory by handling huge quantities of grain. During the war, the Port of Buffalo was easily the largest and most important grain shipment center in the world, moving over twice the cargoes of its nearest European counterpart, Odessa, Russia (Barrick 1970: 19).

When the war finally ended, the relationship between the Federal Government and state governments had unquestionably shifted in favor of the former. No longer could the ultimate authority of the Federal government be challenged by the states. Likewise, Federal spending in internal improvement projects increased greatly after 1865. Buffalo Harbor's modern era began just after the Civil War, when Federal projects assumed major importance and had significant impact on the development of the city's waterfront (Drescher n.d.: 154).

Buffalo's development prior to 1861 resulted from its location on the western terminus of the Erie Canal. The canal and the Inner Harbor made Buffalo a vital and prosperous port city. By the 1860's however, railroads had already begun to eclipse the canal as a transportation mechanism. Passenger traffic on the canal all but ceased. Railroads provided faster service and operated on a year-around basis, in contrast to the canal boats. In spite of physical improvements to the canal and the eventual elimination of canal tolls, the railroads overshadowed the waterway. Buffalo's Inner Harbor declined during the 1870's as eleven railroad lines established themselves in the city.

In 1874, the Grand Trunk Railroad and the Delaware, Lackawanna and Western completed the International Bridge, linking Buffalo to Canada, and the tracks of the Michigan Central and the Grand Island Railroad. Railroads could thus tap a huge market area and they established connecting links to large parts of the United States and Canada by 1887 (Drescher n.d.: 154, Jones Map 1903-1912, Rapp 1947: 36-37).

The city of Buffalo entered another phase of its developmental history with the ascendancy of the railroads. The city became a transfer point in rail-water routes linking the Great Lakes with the nation's rail network. The low cost of lake transport still gave the lake carriers some advantage over the rails, especially in the transportation of bulk commodities. New wheat-growing territories opened to the west and north of Superior, Wisconsin where no railroads yet existed and their crops travelled to market via lake freighters to Buffalo. With the development of the Sault St. Marie Canal, coal and iron ore could be shipped easily and cheaply to Buffalo. The availability of

these resources made Buffalo an important manufacturing center. Flour mills, steel mills and a host of diversified manufacturing enterprises, including lumber and livestock interests developed in Buffalo. The ability of Buffalo to handle the bulky raw materials that its industries required, of course, meant harbor facilities capable of accomodating the largest lake cargo vessels (Rapp 1947: 41-43, Drescher n.d.: 154).

With Federal funds available for internal improvements, U.S. Army engineers turned most of their attention to creating an Outer Harbor for Buffalo. Between 1866 and 1902, Buffalo developed its Outer Harbor by constructing the longest system of breakwaters in the world (Fig. 27-30). Cherbourg, France had only half as much breakwater development. Some 6850 meters of breakwaters created the Outer Harbor (Symons and Quintus 1902: 279).

Early post-war Federal projects included deepening the entrance channel of the Buffalo River, improving and lengthening the Lighthouse Pier and repairing the North Pier (Report U.S. Engineer 1867: 1356, Report U.S. Engineer 1886: 2028-2034, Drescher n.d.: 159-160). In addition to the piers and the channel, the old sea wall on the southern margin of Buffalo, along Lake Erie, received some attention. In 1864, the city acquired title for lands surrounding the incomplete and partially damaged wall. These included a 40 meter wide and 2135 meter long strip of land extending around the work for its entire length. This was called the "Sea Wall Strip." Buffalo agreed to deed the Sea Wall Strip to the United States if Federal authorities would finish the sea wall and maintain the work. No settlement was permitted within the strip. In 1867, Army engineers extended the wall 1646 meters (Report U.S. Engineer 1867: 1356, Symons and Quintus 1902: 252-254). Thereafter, interest in the sea wall diminished as Outer Harbor work drew an ever increasing proportion of available appropriations. Squatters mined the sea wall's masonry for their huts and the work deteriorated. Buffalo cleared the area in 1902 and removed the Sea Wall Strip of squatters, leaving the area "barren" (Symons and Quintus 1902: 256-257).

Between 1867 and 1902, Army engineers worked on a series of construction projects designed to create a large "harbor of refuge" south of the Buffalo River in Lake Erie, they also maintained and improved existing waterway facilities (Report U.S. Engineer 1867: 31-32). The mouth of the Buffalo River was deepened to a 4.3 meter depth. Army engineers repaired the North U.S. Pier and the Lighthouse Pier was extended about 100 meters by 1869. An extension of the U.S. Government section of the old Bird Island Pier was also initiated (Report U.S. Engineer 1869: 146-147, Report U.S. Engineer 1886: 2028-2034).

The main focus of construction activities immediately after

## 1866

- |   |                                      |
|---|--------------------------------------|
| (A) Buffalo Creek   | (Q) Ship Yard                        |
| (D) South Pier  | (R) Ohio Basin                       |
| (F) Erie Canal  | (S) Erie Basin                       |
| (G) 1833 Lighthouse                                       | (T) Sea Wall                         |
| (H) Evans Ship Canal                                      | (U) Hatch Slip                       |
| (I) Commercial Slip                                       | (V) Kinne & Wadhams Slip             |
| (J) Prime Slip  | (W) City Ship Canal                  |
| (K) Main & Hamburg Canal                                  | (X) Niagara (No. 3) Slip             |
| (L) Clark & Skinner Canal                                 | (Y) Erie (No. 2) Slip                |
| (M) Ohio Slip   | (Z) Palmers Slip                     |
| (O) Peacock's Slip extended<br>to Erie Basin (Slip No. 1) | (aa) Coit Slip                       |
| (P) Wilkesons Slip  | (bb) Watson Slip (On the "Island")   |
|   | (cc) Richmond Slip (On the "Island") |
|   | (Jd) Peck Slip (On the "Island")     |

# MAP OF BUFFALO WATERFRONT

COPIED FROM BUFFALO CITY ATLAS

- 1866 -

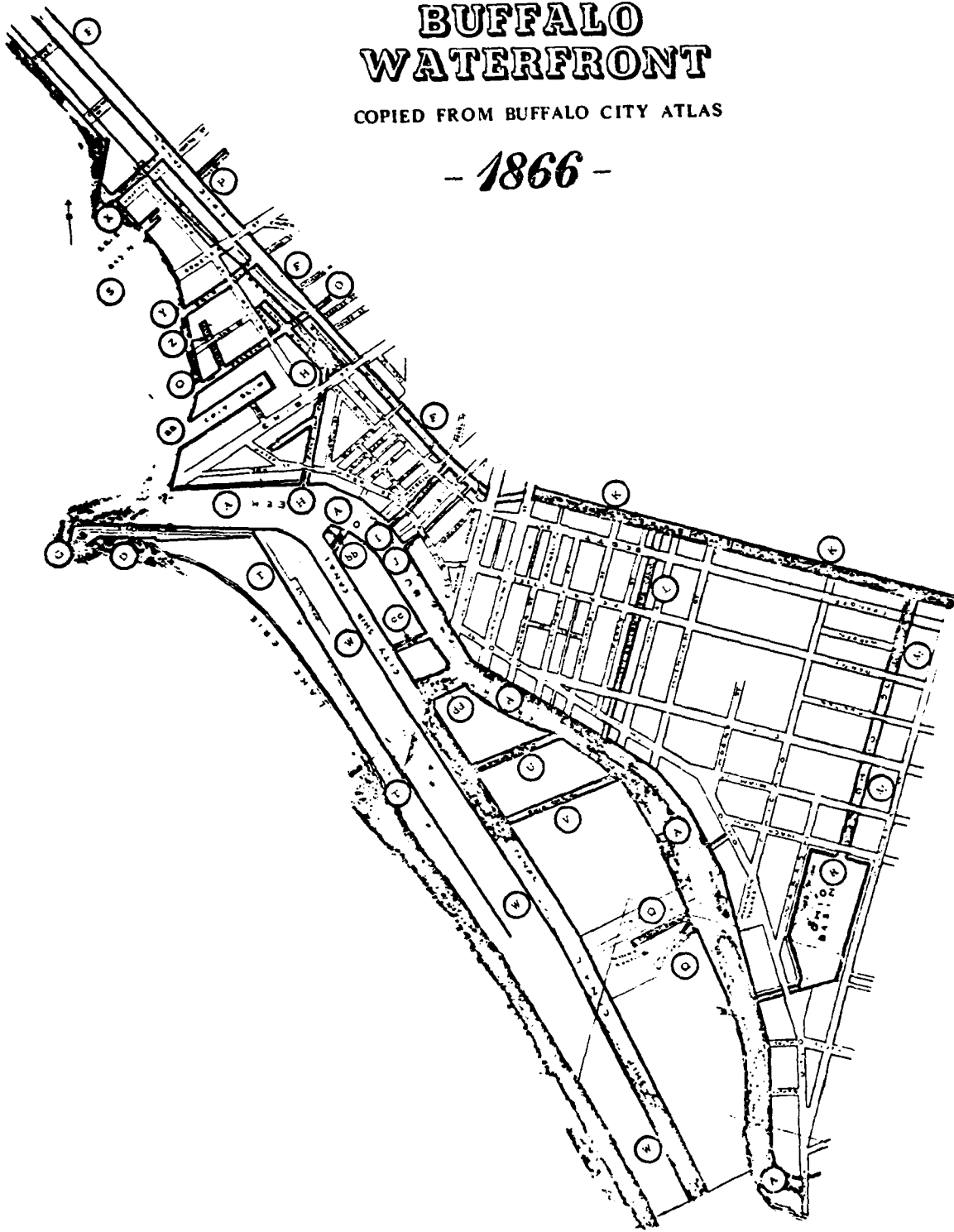


Fig. 22 - Developments in the Buffalo Harbor Around 1866  
(from Baxter and Heyl 1965)

## 1875

- |  |   |
|--|---|
| (A) Buffalo Creek - now 15 to 18 feet deep | (Y) Erie Slip   |
| (D) South Pier                             | (Z) Palmers Slip  |
| (F) Erie Canal                             | (aa) Coit Slip  |
| (G) 1833 Lighthouse                        | (bb) Watsons Slip   |
| (H) Evans Ship Canal                       | (cc) Richmond Slip  |
| (I) Commercial Slip                        | (dd) Peck Slip  |
| (K) Main & Hamburg Canal                   | (ee) Island Slip  |
| (L) Clark & Skinner Canal                  | (ff) Erie Basin Breakwall with 3 finger piers   |
| (M) Ohio Slip                              | (hh) Outer Harbor - Enclosed by 1st Section Outer Breakwater, begun 1869                      |
| (O) Peacock Slip                           | (ii) Breakwater Lighthouse (3rd)  |
| (P) Wilkeson Slip                          | (JJ) Western Slip   |
| (Q) Shipyard - now has 4 drydocks          | (rr) Black Rock Canal   |
| (R) Ohio Basin                             | (ab) Ferry Landing to Fort Erie Grand Trunk Ry. formerly B & L H Ry abandoned in Fall of 1874 |
| (S) Erie Basin                             | (ac) Black Rock Harbor  |
| (T) Sea Wall                               | (ae) Niagara River  |
| (U) Hatch Slip                             | (ah) Hingston's Slip Tug and Canal Boat Yard  |
| (V) Stone & Wadhams Slip                   |   |
| (W) City Ship Canal                        |   |
| (X) Niagara Slip                           |   |

Key to Figure 12

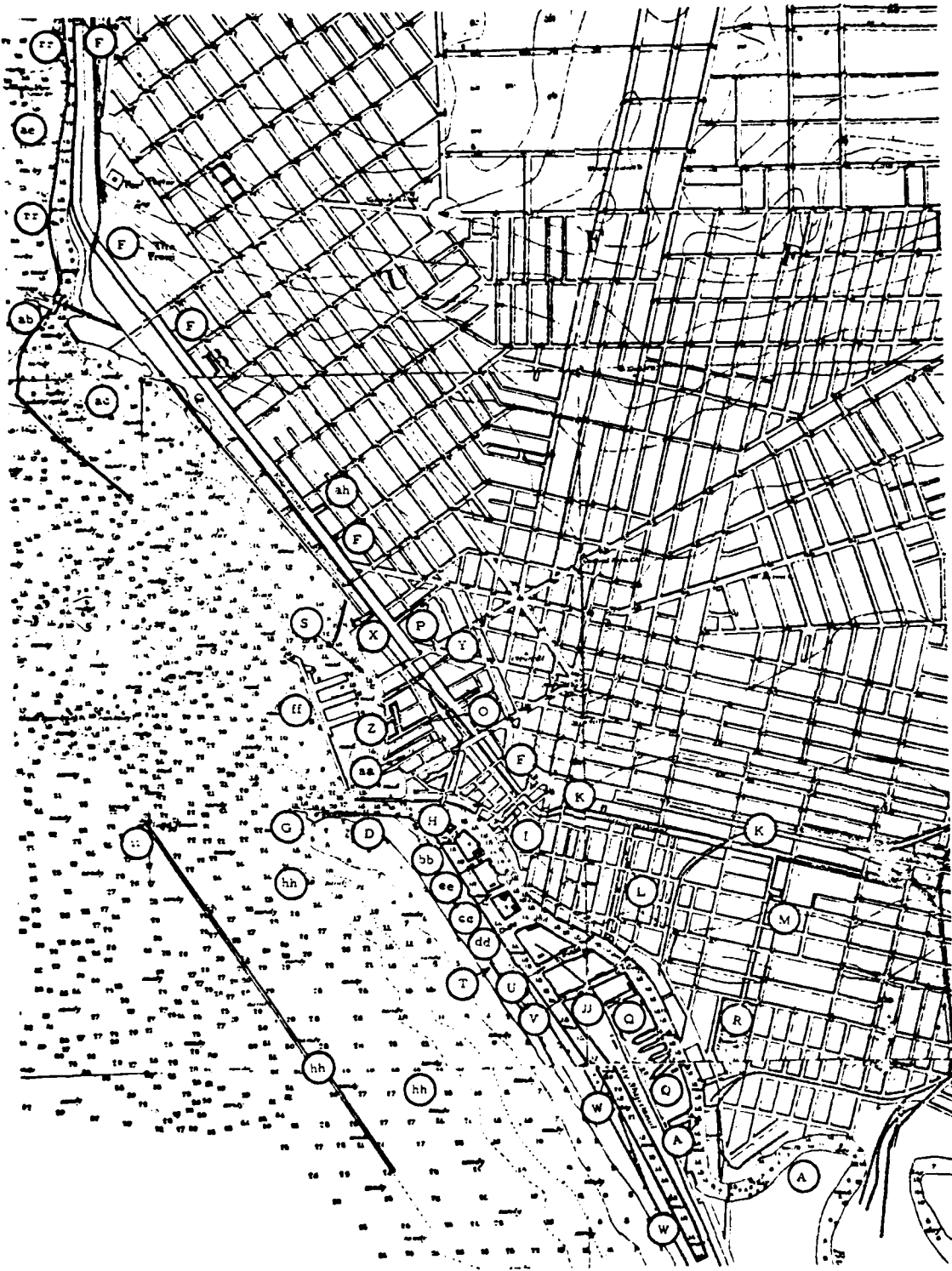


Fig. 25 - Developments in the Buffalo Harbor Around 1875  
(from Baxter and Heyl 1965)

1888

- |                           |  |
|---------------------------|--|
| (A) Buffalo Creek         | (Y) Erie Slip  |
| (D) South Pier            | (Z) Palmers Slip   |
| (F) Erie Canal            | (aa) Coit Slip   |
| (G) 1833 Lighthouse       | (bb) Watsons Slip  |
| (H) Evans Ship Canal      | (cc) Richmond Slip   |
| (I) Commercial Slip       | (dd) Peck Slip   |
| (K) Hamburg Canal         | (ff) Erie Basin Breakwall and<br>Finger Piers  |
| (L) Clark & Skinner Canal | (hh) Outer Harbor  |
| (M) Onio Slip             | (ii) Breakwater Lighthouse   |
| (O) Peacock Slip          | (jj) Western Slip  |
| (P) Wilkeson Slip         | (kk) Lehigh Valley Basin (only<br>partly completed)<br>The 3 Easterly Slips never<br>constructed |
| (Q) Snipyard              | (rr) Black Rock Canal - note wall<br>separating it from Erie Canal                               |
| (R) Ohio Basin            | (ac) Black Rock Harbor - also shown<br>as adjacent to Squaw Island on<br>some maps               |
| (S) Erie Basin            | (ae) Niagara River   |
| (T) Sea Wall              | (ah) Hingston Slip. Tug and Canal<br>Boat Yard   |
| (U) Hatch Slip            |  |
| (V) Kinne & Wadhams Slip  |  |
| (W) City Ship Canal       |  |
| (X) Niagara Slip          |  |

Key to Figure 29

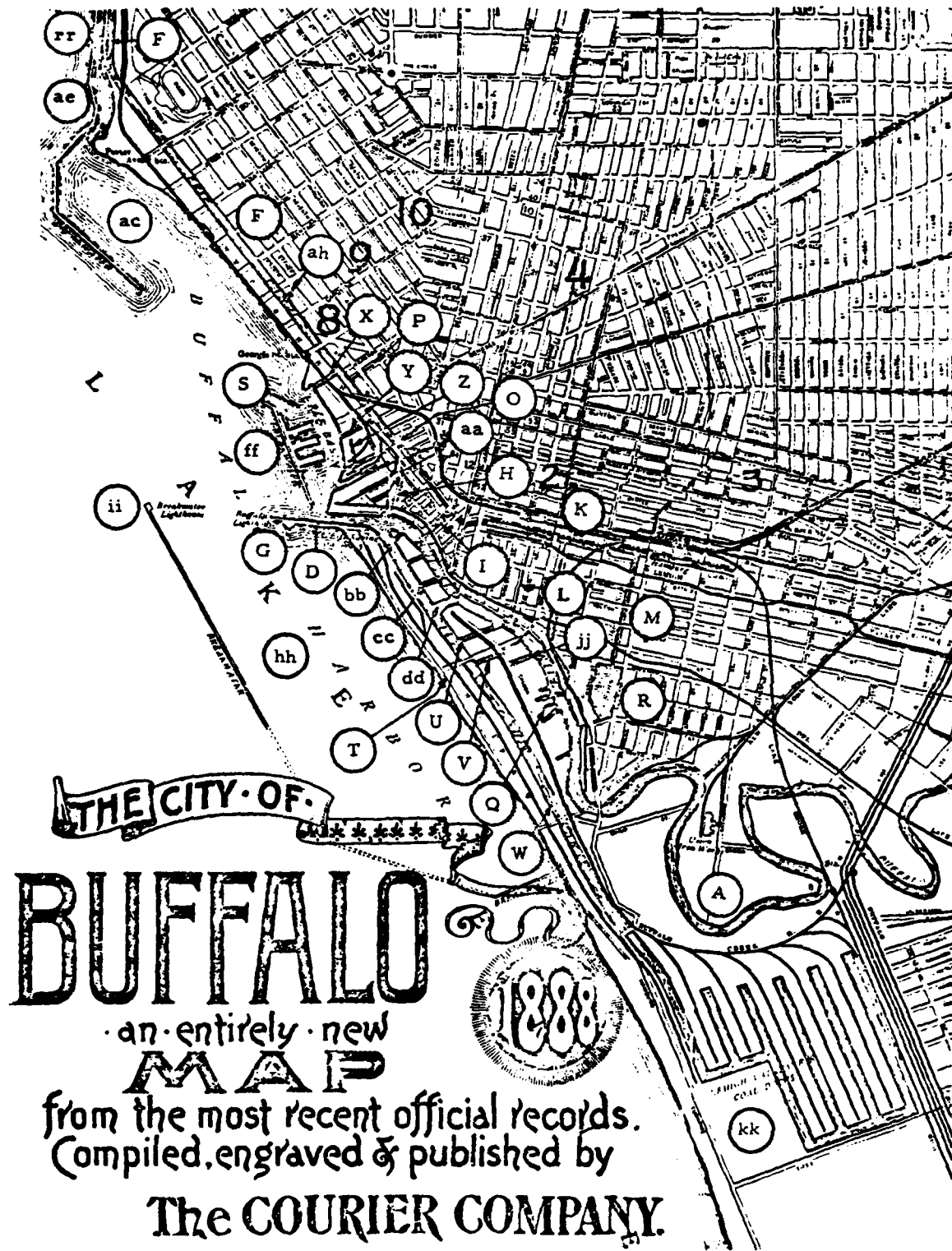
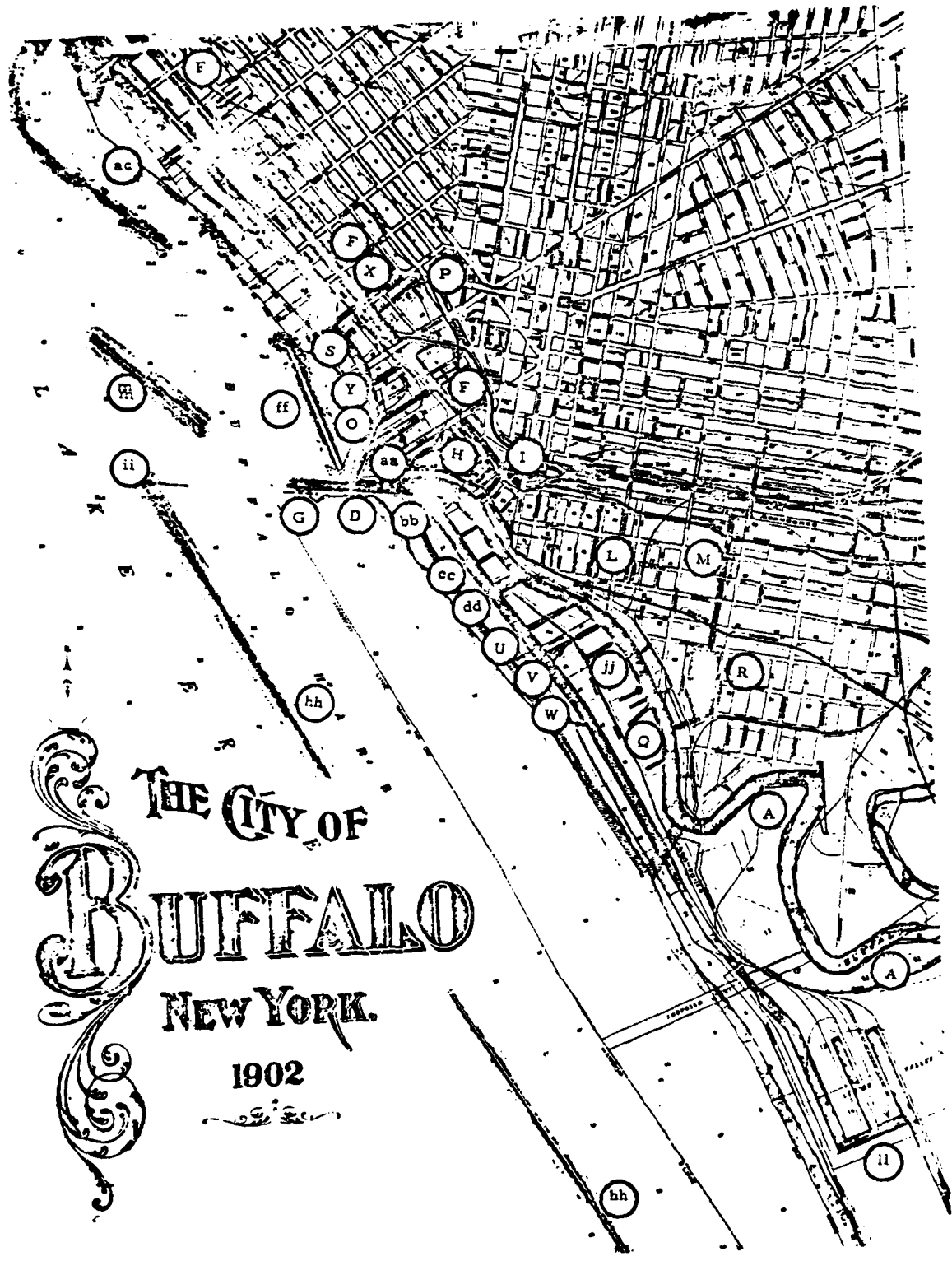


Fig. 22 - Developments in the Buffalo Harbor Around 1888  
(from Baxter and Heyl 1965)

**1902**

- |  |   |
|--|---|
| (A) Buffalo Creek                      | (X) Niagara Slip  |
| (D) South Pier                         | (Y) Erie Slip   |
| (F) Erie Canal                         | (aa) Coit Slip  |
| (G) 1833 Lighthouse                    | (cc) Richmond Slip  |
| (H) Evans Ship Canal                   | (dd) Peck Slip  |
| (I) Commercial Slip                    | (ff) Erie Basin Breakwall -<br><i>Finger Piers are gone</i> |
| (L) Clark & Skinner Canal              | (hh) Outer Harbor - Extended to<br>Lackawanna               |
| (M) Ohio Slip (Partially<br>abandoned) | (ii) Breakwater Lighthouse                                  |
| (O) Peacock Slip                       | (jj) Western Slip   |
| (R) Ohio Basin                         | (ll) Lehigh Valley Basin                                    |
| (S) Erie Basin                         | (mm) North Breakwater                                       |
| (U) Hatch Slip                         | (ac) Black Rock Harbor                                      |
| (V) Kinne & Wadhams Slip               |   |
| (W) City Ship Canal                    |   |

Key to Figure 30



THE CITY OF  
**BUFFALO**  
NEW YORK.  
1902

Fig. 32 - Developments in the Buffalo Harbor Around 1902  
(from Baxter and Heyl 1965)

the Civil War revolved around the building of what is called the "Old Breakwater." Initial plans called for the construction of a 1220 meter breakwater and the creation of an Outer Harbor south of the Lighthouse Pier. While workers labored on the projects, Army engineers enlarged their original plan. In 1874, Congress approved an expanded breakwater project. The 1874 authorization directed the engineers to build a 2320 meter long breakwater and a 365 meter long pier extending west from the shore at the extension at Childs Street (Figs. 27-29). The South Pile Pier (as Sand Catch Pier became known) reached 265 meters into the Outer Harbor by 1879, while 937 meters of breakwater existed by that date as well (Report U.S. Engineer 1878: 972, Buffalo Harbor 1879 Map, Report U.S. Engineer 1880, Barrick 1970: 19).

The Sand Catch Pier did not prevent the movement of sand into the Outer Harbor as intended. Army engineers therefore, extended the work for about 100 meters and began constructing a 366 meter long "shore arm" at a forty-five degree angle to its western end, leaving a 45 meter entry way between it and the southern end of the Old Breakwater (Report U.S. Engineer 1882: 309-310, Symons and Quintus 1902: 258-259, Rapp 1947: 78). A tremendous storm in October, 1893, demolished large sections of the Sand Catch Pier and nearly all of its shore arm (Report U.S. Engineer 1894: 2440-2441). In 1895, the pier was abandoned (Report U.S. Engineer 1896: 3110). Stone work from the shore arm was subsequently mined by workers and used for the construction of the South Breakwater (Report U.S. Engineer 1898: 2763). The pier fell into a state of disrepair as the Outer Harbor grew in size. By 1923, Army engineers reported the work to be "badly decayed" (Report U.S. Engineer 1923: 1568). The Sand Catch Pier was almost totally gone by 1935 and was described as being in "wrecked condition due to abandonment" (Rapp 1947: 78).

Natural calamities also affected the constitution of the Old Breakwater. A storm in 1872 caused the unfinished breakwater to shift in alignment. The resulting damage caused a small salient to form which could not be rectified at the time. The salient became known as the Ice Breaker Section (Rapp 1947: 77). After completing the 2320 meter long breakwater in 1893, Army engineers utilized marine concrete to reconstruct the superstructure of the breakwater, thereby eliminating the salient. A lighthouse was affixed to the north end of the Old Breakwater in 1872 and raised to a total of eight meters in 1899 (Symons and Quintus 1902: 284).

The Lehigh Valley Railway built an immense coal dock or "railroad harbor" near the south end of Buffalo's waterfront in 1884. Major T.W. Symons of the Army Corps of Engineers then

recommended enlarging the plans made to create an Outer Harbor by abandoning the wrecked Sand Catch Pier with its shore arm and instead constructing another long breakwater south of the Old Breakwater. The South Harbor Section breakwater was projected to be 3050 meters in length. An additional 850 meters of breakwater was to be built at an angle from Stony Point. A gap between the two breakwaters would provide a south entrance channel for vessels using the greatly enlarged Outer Harbor (Report U.S. Engineer 1894: 2440-2441, Symons and Quintus 1902: 268-269). Congress approved the plan in 1896 and Symons began work immediately. The South Harbor Section, utilizing new construction techniques and high powered steel tugs, like the Charles F. Dunbar, to transport gravel mined from the Niagara River and Strawberry Island, was completed in 1903. The South Entrance Arm at Stony Point was completed in 1899 and extended during the years, 1907-1910 (Report U.S. Engineer 1896: 3110, Report U.S. Engineer 1898: 2763, 2768-2769, Symons and Quintus 1902: 271, Report U.S. Engineer 1907: 2103, Report U.S. Engineer 1911: 2514). Buffalo thus had use of an extensive man-made harbor able to accomodate vessels of deep draft.

The creation of the Outer Harbor did not complete the engineering work associated with Buffalo's waterfront. In 1900, Major Symons began construction of another breakwater, with the approval of Congress. The breakwater was designed to protect the shoreline from the foot of Porter Avenue to Georgia Street north of the Erie Basin and the southern entrance to Black Rock Harbor (Fig. 30). The 670 meter long North Breakwater was completed in 1901 (Report U.S. Engineer 1900: 4135, Symons and Quintus 1902: 279).

Between 1826 and 1901, the Federal Government appropriated \$4,769,489 to the improvement of Buffalo's harbor. The vast majority of these funds were expended after the Civil War. Buffalo had acquired more breakwater than any other city in the world (Symons and Quintus 1902: 279).

Various interest groups vied with one another in utilizing the protected shores of Buffalo. The municipality of Buffalo, various railroads, private citizens, as well as the Federal Government accomodated each other's goals as best they could. Conflicts naturally occurred. By the mid-20th century, portions of the Buffalo waterfront had become somewhat isolated, while the city experienced a decline in its importance.

Buffalo's population had grown to 155,134 by 1880, making it the thirteenth largest city in the nation. Population growth contributed to a total of 255,654 city inhabitants in 1900. The city was the eighth largest in the country at that time. Waterborne commerce, like the population, also increased. In 1900, Chicago and New York were the only American cities which had

greater amounts of waterborne commerce. Only six ports in the world exceeded the volume of trade handled by Buffalo (Barrick 1970: 25).

Railroads played a key role in transforming the Buffalo waterfront in the later part of the 19th century. In 1879, the Delaware, Lackawana and Western obtained the U.S. North Pier. The corporation altered the pier substantially and began filling in the land behind the work, rendering "useless the government structures placed on the property in the years following 1826. The railroad began using the site as a coal dock (Report U.S. Engineer 1879: 1720). The Federal Government contested this development and even dispatched troops on one occasion. However, the eventual court settlement permitted the railroad to continue to use the facility (Barrick 1970: 21).

As the Outer Harbor approached completion, the Federal Government established a harbor line for the western shore of south Buffalo. The March, 1899 line was drawn west of the existing shoreline and the private owners of lands adjacent to the waterfront were allowed to fill portions of the "underwater lands" bordering their properties to the new line. Since much of the south Buffalo shore was under the control of railroad corporations, the railroads filled areas fronting the Outer Harbor (Report U.S. Engineer 1898: 2781-2782, Sea Wall Strip Map 1910).

The dumping of dredge material along the harbor line necessitated the hiring of inspectors by the Army Corps of Engineers to insure that the Federal line was observed by private interests (Report U.S. Engineer 1912: 2716). Between 1880 and 1909, areas south and west of the old sea wall were filled (Paul, Peter and Brother 1880 Map, U.S. Lake Survey 1901 Map, Fisk 1909 Map, U.S. Lake Survey 1918 Map). Federal lands south of South Pier were also filled by 1909 (Fish 1909 Map). Federal claims to the sea wall ship area were surrendered to the city after 1898 and the municipal government transformed the area by constructing the Hamburg Turnpike and Fuhrmann Boulevard to encourage additional development (Report U.S. Engineer 1898: 2781-2782, Sea Wall Strip 1910 Map).

In 1900, the Lackawanna Steel Company built a large plant in the extreme south end of the Outer Harbor and in 1903 dug a slip (or canal) into the harbor as seen in Fig. 30 (Barrick 1970: 23). Two years later, the Union Ship Canal linked the Outer Harbor with the iron and steel business owned by the Buffalo and Susquehanna Railroad. The Great Lakes Portland Cement Company filled an area north of the Union Canal in 1926, and the Pennsylvania Railroad erected a grain elevator north of that area in 1925, which became the Saskatchewan Cooperative elevator in 1926. The Terminal and Transportation Company filled an area north of the elevator in 1926 (which became the Merchant Refrig-

erator and later the Freeze Queen site). Ford Motor filled an area near the Hamburg Turnpike and built a pier into the Outer Harbor in 1931. The city constructed two piers in 1926 and coupled with the 1918 Buffalo Marine Construction Company's pier, this completed the development of Outer Harbor facilities south of the Lighthouse Pier (Graham and Severance 1945: 186, Barrick 1970: 41).

Considering that the Outer Harbor was completed in 1903 and that it provided some 5250 meters of protected shoreline for use, actual development within the area occurred slowly. In 1921, for example, the Army Corps of Engineers reported that a mere 150 meters of the available shoreline had been improved with terminal facilities (Report U.S. Engineer 1921: 1693). Five years later, the Outer Harbor still had only 275 meters of improvements (Report U.S. Engineer 1926: 1486). Large-scale construction took place thereafter, and by 1931, 1615 meters of facilities studded the south Buffalo shoreline, in time to experience the effects of the Great Depression (Report U.S. Engineers 1931: 1681).

The Rivers and Harbors Act of 1902 authorized Federal expenditures to deepen the entrance to Buffalo Harbor along with the entrance and channel of the Black Rock Canal at the foot of Maryland Street. Work was completed in 1908 (Report U.S. Engineer 1912: 2722, Barrick 1970: 26). Army engineers improved the Black Rock Canal between 1905 and 1914, widening the waterway and replacing sections of the Bird Island Pier (Report U.S. Engineer 1905: 2384, Report U.S. Engineer 1907: 2111, Report U.S. Engineer 1912: 2722). In addition, a new lock system for the Black Rock Canal was approved. Contracts were let for the construction of six gate operating houses. The main lock house was constructed on the site of the Banner Milling Company property and all of the old buildings were removed. The Black Rock Canal lock began operating in 1914 (Report U.S. Engineer 1915: 3300-3301, Report U.S. Engineer 1918: 3290-3291). The District Office for the U.S. Army Corps of Engineers was located in the 1914 lock house at the foot of Bridge Street (Barrick 1970: 33). The purpose of the Black Rock Channel and lock improvements was to provide additional protection for vessels caught in storms, but only small vessels and barges actually made use of the facilities (ibid: 28).

In 1913, Federal authorities transferred control of the northern 900 meters of the Bird Island Pier to the City of Buffalo for the development of what is now Broderick Park (Report U.S. Engineer 1921: 1699). Army Engineers replaced the old Ferry Street Bridge with a Strauss trunion one leaf bascule bridge having a moveable span of 50 meters and a roadway of 9.1 meters, between 1912 and 1915 (Report U.S. Engineer 1912: 2722). Municipal development of the area began in 1921 and in 1926, a struc-

ture was built in the park for the use of the West Side Rowing Club (Barrick 1970: 38).

Initial municipal efforts to develop plans for the future development of the Buffalo waterfront began in 1912 (Graham and Severance 1945: 160-161). City lands along the waterfront, north of the Erie Basin and south of the Bird Island Pier Park were filled. By 1919, the city acquired title from private owners to all the waterfront land from Porter Avenue to Georgia Street and filled them prior to 1931. The area became LaSalle Park after 1932 (Jones 1903-1912 Map, Davey's 1915 Map, Barrick 1970: 38). The city constructed the Colonel Ward Pumping Station on the northern end of LaSalle Park between 1909 and 1915 (Barrick 1970: 36). The international automobile Peace Bridge linking Buffalo with Fort Erie, Ontario, was completed in 1927 in the area between LaSalle Park and the Bird Island Pier Park (Graham and Severance 1945: 182).

The Buffalo Yacht Club was organized in 1860 and settled off the foot of Porter Avenue in 1892 where a large clubhouse was constructed in 1893. The city built a dock for the group. A new municipal water intake from the Niagara River was planned, however, and the Buffalo Yacht Club's headquarters had to be moved due to filling operations being carried out in association with the water intake and an extension of Porter Avenue. The city provided another site for the Yacht Club but the new location displeased members because of its inland location. In 1923, the club and its building moved again, to its present waterfront location south of the Peace Bridge and north of the Colonel Ward facility. At the same time, the city turned over a small parcel of waterfront land immediately north of the Buffalo Yacht Club to the New York State Naval Militia. The state's Naval Militia became associated with the Naval Reserve in 1948. It leased property to the Sea Scouts in the 1930's. In 1952, a new scout structure was completed but it was abandoned in 1966. The building became the Great Lakes Laboratory in 1967 (Barrick 1970: 34-35).

#### The American Period After 1930:

The Great Depression hurt Buffalo's citizens as it did most other Americans. Trade, commerce and employment fell. The Erie Canal lost any remaining importance as a means of transportation. The Niagara River Section of the Canal was filled prior to 1941 (Barrick 1970: 41). The use of petroleum as a fuel grew and coal's importance declined, as did the shipping of this resource (ibid: 31). The completion of the Panama Canal in 1914 and the Federally supported deepening of the Miss-

issippi River from St. Paul to New Orleans, provided water routes that lured some of the commodities that had been shipped to Buffalo into other avenues. The reopening of the Welland Ship Canal in Canada in 1932 and the talk of a seaway in the St. Lawrence River also had a negative impact on Buffalo shippers. The improvements to the New York State Barge Canal along its Hudson River to Oswego section had negative implications (Barrick 1970: 31-32). In summation, transportation routes which had helped to create Buffalo as a major center, were now about to shift in favor of other localities.

The Second World War delayed Buffalo's decline by greatly stimulating its economy, as well as that of the nation as a whole. One billion dollars worth of war orders came to Buffalo even before Pearl Harbor. After the United States entered the war, billions of dollars worth of manufactured items poured from Buffalo's factories. All lake vessels were pressed into service as large amounts of oil, grain, limestone and coal were shipped to, and through, Buffalo. Industry and the port facilities operated at full capacity (ibid: 38).

After the end of the war, all of the limiting factors that the conflict had temporarily obscured, returned with considerable force. Grain handling declined rapidly and coal shipments dropped. Competing water routes attracted commerce that had, at one time, been handled at Buffalo. Population leveled off and the city's relative importance shrank (ibid: 41-43). The number of port-oriented facilities dropped from seventy-four in 1951 to sixty-one in 1961 (Lake Series 1951: 33-34, Port Series 1972: 15). Outer Harbor facilities specialized in handling commodities such as milk, oil, iron, limestone, cement, autos, some grains and general cargoes. The Inner Harbor handled grain, oil, limestone and service yards. The Niagara River Section now was developed into parks and sewerage treatment facilities, had a large collection of waterfront businesses handling petroleum-related products (Lake Series 1951: 33-34).

In 1959, the Niagara Section of the New York State Thruway opened after paving the bed of the Erie Canal. Rail corridors moved into the Thruway's right-of-way. Together, the roads and tracks made a natural barrier isolating the waterfront immediately to the west. In 1970, Buffalo's Waterfront Urban Renewal housing project near the Erie Basin finished demolitions in the area which used to be the heart of the city's Erie Canal-related commercial developments. As Barrick (1970: 47) noted, "No traces will remain of the industrial and commercial uses that were first stimulated by the Erie Canal after 1825" (Barrick 1970: 47).

In 1962, Federal authorities cut an entrance into the north end of the Old Breakwater. The following year, a new break-

water was constructed to protect the entrance to the west (Fig. 31). The West Breakwater was the final major Federal work completed in the harbor area (ibid: 47).

Filling and other improvements continued in the Outer Harbor so that the port could attract ocean-going vessels and offer some competition to the St. Lawrence Seaway. In addition, city planners hoped to increase the use of the area by recreational boaters. North of the Saskatchewan Cooperative Elevator the U.S. Army Corps of Engineers Dredging Disposal Area (1968-1970), was placed. It was then an extensively filled area created by the Niagara Frontier Port Authority, to attract new ocean commerce. The Times Beach recreation area was planned to be made (1970) from filled lands (Barrick 1970: 54).

North of the old Erie Basin, filling was carried out on the low-lying areas of Squaw Island. An incinerator plant was placed on the island in 1952, near the city's sewerage disposal facility. Small boat marinas, both private and municipal, sprang up in the area north of the Erie Basin as well (ibid: 54). The Lower Black Rock Harbor still has some commercial users and oil products are the principal items handled. Small boat basins exist in the area also.

#### Summary of Historic and Harbor Developments 1820-1970:

Buffalo's waterfront developed in response to the needs of waterborne commerce. As long as water traffic remained high, the port thrived. When the Erie Canal linked Buffalo with New York City and the Atlantic Ocean, the small canal boats dominated the use of the Inner Harbor. As vessels improved and grew larger, and as lake shipping became more important than canal traffic, the Outer Harbor helped alleviate the overcrowding and space limitations of the Buffalo River. Throughout the period of 1826-1903, the U.S. Army Corps of Engineers made significant improvements to the port in the interests of safety, improved navigation and commercial development.

Buffalo's waterfront, however, was isolated from the city in the north by the Erie Canal and later by the railroads and modern auto highways. Extensive filling built the waterfront out to the west and little thought appears to have been given to linking the front to the rest of the city in a manner that encouraged ease of access. In the Outer Harbor, much the same situation existed. It is now difficult to even get to many areas of Buffalo's waterfront, with the exception of the LaSalle Park, Erie Basin Marina, Squaw Island and the Bird Island Pier (which is heavily used).

Maps in this report depict the sites of historic signifi-

1964

- |   |  |
|---|--|
| (A) Buffalo Creek -<br>Straightened & Re-aligned,<br>22' deep | (nn) South Entrance  |
| (C) South Pier  | (oo) Union Canal   |
| (3) 1333 Lighthouse<br>(None operational)                     | (pp) Lackawanna Canal -<br>Built 1903  |
| (H) Evans Ship Canal Remnant                                  | (qq) N.Y. State Barge Canal<br>Terminal - Not in use<br>(Templeton Terminal) |
| (J) Peacock Slip  | (rr) Blackrock Canal   |
| (Q) Shipyard (Abandoned)                                      | (ss) Municipal Piers   |
| (S) Erie Basin  | (tt) Niagara Frontier Port Authority<br>Terminal - Ex-Food Plant             |
| (W) City Ship Canal   | (uu) Pool Elevator   |
| (Y) Erie Slip   | (vv) Merchants Refrigerating Co. Pier  |
| aa) Coit Slip   | (ww) Small Boat Harbor   |
| ff) Erie Basin Breakwall                                      | (xx) West Breakwater - Completed 1963  |
| nn) Outer Harbor  | (yy) New Buffalo Lighthouse<br>(4th in a series)                             |
| rr) Breakwater Lighthouse                                     | (zz) Avec being filled for industrial<br>use                                 |
| tt) Lenigh Valley Basin -<br>Landlocked                       |  |
| --) North Breakwater  |  |

Refer to Figure 21



*Buffalo Harbor*  
*Including Black Rock Canal*  
SOUNDINGS IN FEET - SCALE 1:15,000

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Fig. 31 - Developments in the Buffalo Harbor Around 1964  
(from Baxter and Hoyl 1965)

cance along the waterfront. As might be expected, the area fronting the Outer Harbor had a low sensitivity as far as sites of historical importance are concerned. This relates to the filling and lateness of development. All of the sites noted on the maps are not strictly within the confines of the project area under review. As noted in the introduction, the only land areas that might be impacted by the Commercial Navigation and Debris Removal Project are those between the heliport and the Cargill Pool Elevator in the extreme south of the Outer Harbor. The Cargill Pool Elevator was originally constructed in 1925 and was sold to the Saskatewan Cooperative in 1926.

Other features of historical interest include the breakwaters, as they in fact created Buffalo's harbor. These stretch back in time to the Bird Island Pier in the 1820's.

### CULTURAL RESOURCES IN THE IMMEDIATE PROJECT AREA

An important product yielded by the literature and records search was a list of cultural resources in, or immediately adjacent to, the project area. These sites are discussed as follows.

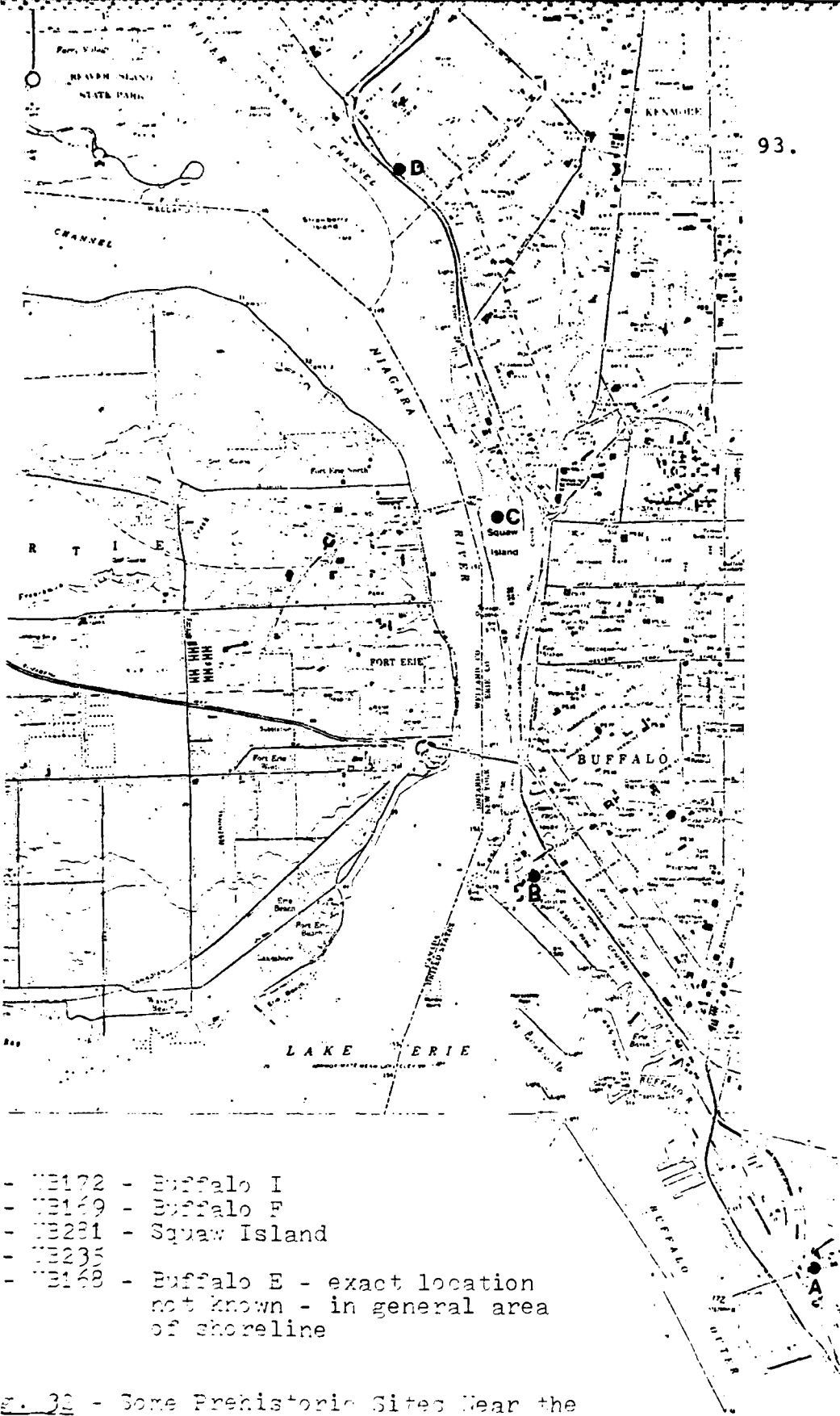
#### Prehistoric Sites

Only five of the sites listed in Appendix #1, might be considered as in the immediate vicinity of the project area (Fig. 32). They are all within about 300 meters of the modern shoreline. These sites are as follows:

| <u>Name</u>  | <u>No.</u> | <u>Description</u>   |
|--------------|------------|--|
| Buffalo E    | UB168      | no information on this site-destroyed  |
| Buffalo F    | UB169      | occupation site-celt, gorget, notched point recovered-probably destroyed               |
| Buffalo I    | UB172      | occupation site-debitage-probably destroyed  |
| Squaw Island | UB281      | site described as one projectile point located on island south of International Bridge |
|              | UB235      | workshops-probably destroyed   |

All of these sites have several things in common. First, all of them have either been destroyed or have probably been destroyed by extensive development. Only the Squaw Island Site is located in a relatively undeveloped area. A second shared trait is that little data is available on these sites as they were probably destroyed some time ago before they could be studied by professional archaeologists. As such, there is no specific cultural or temporal data on the sites. It should be noted that none of these sites are actually in the project area.

Finally, there are a series of sites on the southern and eastern portions of Grand Island. The closest of these to the project area is probably the Martin Site (UB214) which is at least 1.0 kilometer north of the project area. Southern and eastern Grand Island are relatively undeveloped areas and it is likely that numerous prehistoric sites may be found there.



- A - 3E172 - Buffalo I
- B - 3E169 - Buffalo F
- C - 3E281 - Squaw Island
- D - 3E235
- E - 3E168 - Buffalo E - exact location not known - in general area of shoreline

Fig. 32 - Some Prehistoric Sites Near the Project Area

### Historic Sites

Numerous historic or potentially historic structures are reported for the Buffalo Waterfront. This is to be expected in consideration of the history of the city as one of the world's major port cities for almost one hundred years. Information on these structures was obtained from the Coastal Zone Management Program study (1977), the study done by Daly and Ruggerio (1982) and from Dr. Zeitlin's studies in relationship to this project. These sites are noted in Appendix #3.

While some historic, or potentially historic sites, such as the Colonel Ward Pumping Station (1909-1914), the International Railroad Bridge (1873) and the Peace Bridge (1927) are near the project area, almost no sites are in immediate proximity to, or in the project area.

The scarcity of historic sites in the Outer Harbor area can be explained by the pattern of development that occurred in that area. As noted in the cultural overview section of this report, the area that came to be protected by the Old Breakwater and the South Breakwater had been at first protected by a sea wall. The city of Buffalo cleared the Sea Wall Strip, removing both people and houses on two occasions. After being wrecked by storms, the Sea Wall was abandoned and work begun on the breakwaters. The Sea Wall Strip became the roadbed for Fuhrmann Boulevard. After the turn of the century, property owners were allowed to fill areas west of the old strip to the 1899 harbor line established by the Corps of Engineers. The advance of the filled areas can easily be seen by referring to maps dated from 1900 to 1970. In summation, much of the land fronting the Outer Harbor is of recent origin and is therefore less likely to be the location of historic structures, while the filling may be responsible for obscuring the former locations of structures and events.

Another factor that prevented the development of the lands fronting the Outer Harbor was the near monopolization of that area by railroads. The railroad companies were not interested in developing shipping terminals which might compete with their lines, especially after the Interstate Commerce Commission divested the railroads of their ship lines in a 1912 anti-monopoly case.

#### Structures:

Perhaps the only structure in immediate proximity to the project area is the Cargill Pool Elevator. This structure was originally built by the Pennsylvania Railroad in 1925. The elevator was the first non-dock facility constructed in the Outer

Harbor.

Breakwaters:

This report has identified a series of harbor works. While it is not clear whether any of these might be impacted by the proposed dredging activities, they include the following;

- Bird Island Pier - 1822 (extensions in 1829, 1830's and 1869)
- Chinaman's Lighthouse - 1833
- New York State Breakwater - late 1850's
- Horseshoe Reef Lighthouse - 1856
- Old Breakwater - 1860's
- Old Breakwater Lighthouse - 1872
- North Breakwater - 1901
- South Breakwater - 1898

Shipwrecks:

Shipwrecks are an important cultural resource which are only beginning to be appreciated and afforded protection. Shipwrecks offer several traits which are not often found at other archaeological sites or historic structures. Almost all shipwrecks are single component sites. They represent a limited period of time in terms of nautical design development and equipment. Similarly, the life of the ship usually represents a relatively brief period of time. Almost every ship which was lost near Buffalo went down less than 20 years after it was launched. As a result, the portable artifacts associated with the wreck often provide interesting insights into the technology and commerce of a specific time. Portable artifacts from shipwrecks may include personal effects as well as container items of ceramic and glass which give important information on technologies and practices.

At least 52 vessels are reported to have foundered, exploded, burned or sunk in Buffalo Harbor, or in close proximity. These vessels are listed in Appendix #2. The information was obtained from Winkelmann (n.d.), Hedin (1966), Berman (1963) and Daly and Ruggerio (1982). Interestingly, none of these sources provided the exact same lists as any other sources. This suggests that no source of information is inclusive and that various wrecks, especially of small vessels, may have escaped the notice of interested compilers.

A problem with dealing with shipwrecks is that information on the location of sunken vessels is often very imprecise, as the exact location of sinking was often never reported. Sunken

vessels may also have their location shifted through time and they may break up entirely. Some vessels may have been partially or entirely salvaged. Ships lost at dock may have been incorporated into land fill projects only to reappear in future excavation for construction.

Of the fifty-two wrecks in the general vicinity of the Buffalo Harbor, only eight have relatively specific locations. They are as follows (Fig. 33);

B.B. McColl - steamer - 489 tons - burned at McColl Bros., Inc.  
dock in 1928

C.H. Young - listed as sunk near the entrance to the Erie Basin

Falmouth - schooner - 234 tons - sank at the new breakwater (Old  
Breakwater?) in 1880

Inter-Ocean - listed as sunk near the entrance to the Erie Basin

John W. Cramer - steamer - 23 tons - sank on Horseshoe Reef in  
1884

Keystone State - oil screw - sank at the Great Lakes Dock and  
Dredge Co. at the foot of Katherine St.

Myrtie - schooner - 25 tons - sank on Horseshoe Reef in 1907

Troy - steamer - exploded and burned off of Black Rock in 1850  
with 22 fatalities

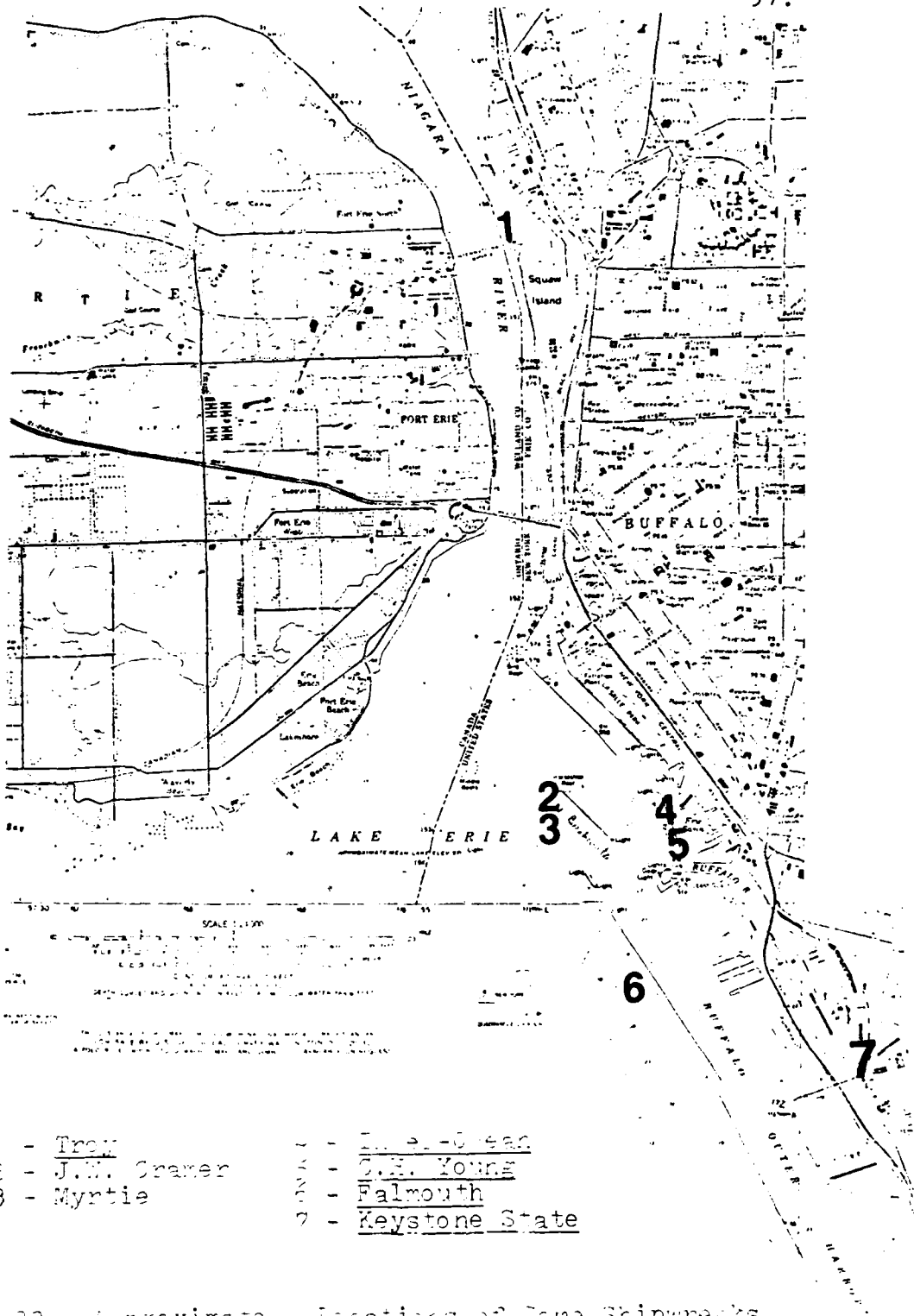


Fig. 22 - Approximate locations of some shipwrecks in the Buffalo Area

## FIELD STUDY

The survey activities for this project were limited by the nature of the survey area. As noted in this report, the project is almost entirely restricted to the harbor area. Only a small strip, about 400 meters long, is on land. This is just north of the heliport site to Fuhrmann Boulevard and N.Y.S. 5 to the east. This area was probably either marshy or under water prior to the 20th century and thus, has a very low potential for the presence of prehistoric sites. If any are present, they are buried beyond practical investigation. The rest of the harbor shoreline is not in the project area and is also extensively disturbed and/or filled.

Erosional cuts and ditches were examined in various sections of the shoreline. The largest of these was a utility ditch being dug across LaSalle Park. The ditch was over 300 meters long and 1.5 meters deep. The soil profile showed the presence of fill to the bottom of the ditch, confirming the information on the area secured in the literature and records search.

Of some interest in the study of the ditch in LaSalle Park was the nature of the fill used. The presence of thousands of shell fragments indicates that at least part of the fill had its origin as dredge spoil. The fill also contained numerous fragments of historic artifacts. These included fragments of glass bottles made on semi-automatic bottle machines and automatic bottle machines. The semi-automatic bottle-making machine was first put into use in 1881 and automatic bottle machines were introduced in 1903 (Weitzman 1976: 142). Also present were numerous pieces of ceramic including whiteware, decaled whiteware and what may be hand-painted whiteware with the "Sprig" or "Gaudy Dutch" pattern. Whiteware began to replace pearlware around 1820 and became common after 1850 (Hume 1969: 131, Adams 1980: 516). The decaling process was patented in 1852 and became commercially successful by the mid-1860's (Ingersol 1971: 208). The "Sprig" or "Gaudy Dutch" design was popular in the 1860's (Annette Nekoola: pers. comm.). The fill contained pieces of rubber, brick, cement and fragments of electrical components.

The materials from the fill in LaSalle Park are those which might be expected in a late 19th and 20th century fill or dump. These artifacts were obviously brought into the park area and have no original provenience. They are fragmentary and relatively common items. However, it is interesting to note the presence of the ceramic and bottle collection in the fill and that even highly disturbed areas may still be repositories of artifacts which could yield some information.

Strawberry Island was also visited as a part of the field survey. The literature and records search indicated that the island had undergone extensive disturbance from both deposition of dredge spoil and from gravel quarrying activities. It was hoped that some portion of the island might have remained relatively undisturbed. The field work demonstrated that this is not the case. Shovel testing indicated the presence of sand and gravel and extensive disturbance. This was also noted in a two meter high cut bank examined on the west side of the island. Much of the island is now marshy vegetation. The island has a large amount of recent historic debris left by fishermen and picnickers. Also present are the remains of a small pier on the west side of the island.

The field survey included the examination of the structures near the heliport site. These include the Cargill Pool Elevator which was originally constructed by the Pennsylvania Railroad in 1925 and sold to the Saskatchewan Cooperative in 1926. It is located near the old Merchant Refrigerator (Terminal and Transportation Company) dock, which was built around 1926 and the Ford Motor Company dock (1931) which has become part of the Niagara Frontier Port Authority. The Cargill Pool Elevator is made of reinforced concrete construction. It is the only remaining elevator in the Outer Harbor area.

The last part of the field survey included an examination of the Bird Island Pier. This old structure was originally built to help the village of Black Rock secure the terminus of the Erie Canal. Today, the pier is in poor condition and waves wash over the top, even in relatively calm water. It is potentially dangerous to use and several peoples have been swept off of it. It is still heavily used by local fishermen.

## SUMMATION AND RECOMMENDATIONS

In August and September, 1983, the principal investigators conducted a cultural resources reconnaissance survey of the proposed project area for the Buffalo Harbor Commercial Navigation and Debris Removal Study. The project included an intensive literature and records search and a field survey of the tentatively identified project area.

### Prehistoric Cultural Resources

It is the opinion of the authors that the proposed project will have no adverse effect on any prehistoric sites which might qualify for inclusion on the National Register of Historic Places. This conclusion is based on several facts established by the literature and records search and the field work.

The most important factor to consider is that the project area is almost entirely underwater. Further, it is likely that this area was underwater during the time of occupation by Native American groups. The Buffalo shoreline has been extending westward through time. Much of the area along the harbor and the Niagara River was not dry land prior to the 20th or late 19th centuries. Much of what was above water was described as low and marshy by 19th century observers. Site files do indicate that there is a considerable density of sites along the creeks which flow into the Buffalo River and along that river itself before it reaches Lake Erie. These sites are often located on terraces and other elevations several kilometers from the project area.

It is by no means impossible that some sites may have been located on small, higher terraces and elevations along the Buffalo shoreline. The Buffalo F site, UB169, if it is correctly located at the present site of the Colonel Ward Pumping Station, is relatively close to the shoreline and the project area. However, sites such as this would now be covered by meters of fill or, like UB169, lie under buildings, parking lots, roads and other construction.

It may be noted that there are some areas within a few kilometers of the project area which have a considerably higher potential for the presence of extant prehistoric sites. The most important of these are the southern and eastern shores of Grand Island. The southern end of the island lies just about 920 meters northwest of Strawberry Island, the northern terminus of the project area. Grand Island is the location of such major Early Woodland sites as the Martin Site (UB214), The Rumsey Village Site (UB453) and the Riverhaven I (UB192) and II (UB193)

sites. Other, smaller sites have also been identified in this area (Ritchie 1969, Granger 1978).

Grand Island is out of the project area, however, some consideration should be given to the secondary impact on the island of developments in Buffalo Harbor. If improvements to the Buffalo Harbor lead to changes in erosion patterns, such as increased erosion due to wave action caused by a higher volume of large shipping, some sites may be damaged.

In summation, it would not appear that the project area has much potential for the presence of prehistoric sites. The area was formerly marshy or underwater. Sites which may have been located on higher elevations along the shore are almost undoubtedly buried by fill or destroyed by other developments.

#### Historic Sites (1600's-1820)

It is the authors' opinion that no historic sites for the period between the early 1600's and 1825 will be impacted by the proposed project. This assessment relates to the nature of the historic developments in the area and the nature of the project area itself.

No historic Native American village sites are reported for the immediate vicinity of the project area. Such sites were frequently located on secondary streams away from major waterways for purposes of protection. Reservation Period structures were located on the Buffalo Creek Reservation well to the east of the project area. As noted in this report, the Reservation did not include the strip along the lakeshore. This area was reserved by New York State in the Treaty of Canandaigua. The site of the village of Buffalo was also excluded from the reservation.

The French and British Periods of ownership in the Buffalo area were marked by a lack of permanent occupation. While various missionaries, traders and soldiers sailed past the area, or perhaps landed briefly, there were no permanent settlements. Perhaps the only settlement was the brief one (1758-1759) started by Joncaire. While there are several interpretations as to the location of the few structures built, they do not fall into the project area.

The early period of American occupation in the area also did not include many structures. The early cabins were built on the Buffalo River, but away from its confluence with Lake Erie. The early village, built prior to the War of 1812, is also not in an area to be impacted by the proposed work. The same is true for most of the early harbor developments (the Bird Island Pier will be further discussed). Finally, only

one shipwreck is reported for the Buffalo Harbor area before 1825 (although there were probably others). This is the Walk-on-the-Water which sank in 1821. The exact location of the sinking was not noted in this study but it is known that the engines and other gear from the wreck were salvaged and used in another vessel.

The lack of early structures in the general vicinity of the project area does not mean that there were no historical events associated with the immediate shoreline area. As discussed in this report, the British landed at both Black Rock and in Buffalo during the War of 1812 leading to two battles and the burning of the village at the end of 1813. A "site", in terms of the requirements for the National Register of Historic Places is "the location of a significant event, a prehistoric or historic occupation or activity, or a building or structure whether standing, ruined or vanished, where the location itself maintains historical or archaeological value regardless of the value of any existing structure" (36 CFR 63 in the Federal Register Vol. 42, No. 183, 47666-47667). As such, the location of the British landings and the battles, the location of Joncaire's settlement or the location of the "black rock" in the original Black Rock harbor (which was destroyed in the construction of canal-related facilities) could be construed as sites which could be considered as potential nominees to the National Register of Historic Places. However, such an interpretation is probably not important to this study. Most of the early events and structures in the Buffalo area have indefinite locations, but they do not appear likely to be impacted by the proposed harbor improvements.

In summation, the recommendations for early historic resources in the project area must be the same as for the prehistoric resources. That is, no such resources will be impacted by the proposed work. This relates to the nature of the project as being primarily in the harbor and the location of early structures and events at least a few hundred meters away from the current lakeshore. Any important events which occurred in the immediate vicinity of the project area, or structures which may have been built, have indefinite locations in an area greatly modified by subsequent development.

#### Historic Period (After 1820)

In dealing with the potential cultural resources of the period after 1825, there are several categories of sites; the locations of specific events, structures, harbor improvements and shipwrecks.

Harbor improvements in the project area include a number of breakwaters and lighthouses noted on Page Two of these structures merit special attention. The first is the "China-man's Light" lighthouse, one of the oldest lighthouses on the Great Lakes. This structure was built in 1833 of ashlar limestone and bluestone to a height of 13.3 meters. The name comes from the top of the structure which bore some resemblance to a Chinese hat. The lighthouse was slated for demolition but was saved and restored as a result of community action. The building was included on the Historic American Building Survey of 1965 (Daly and Ruggerio 1982: 98).

The second structure in the harbor worth noting is the Bird Island Pier. The original Bird Island Pier dates back to 1822, when construction was begun. This is an early date in the history of the area. The pier pre-dates the Erie Canal. It is the oldest (although much modified, extended and repaired) work that remains in Buffalo Harbor. It is an example of pioneer energy and engineering skill, akin to other early developments such as the South Pier. The Bird Island Pier is likely to be eligible for inclusion on the National Register of Historic Places. There are no structures extant in Buffalo's harbor area which retain such an intimate and historically significant association with the early developments of Buffalo Harbor as the Bird Island Pier.

In a letter dated April 23, 1984, the Buffalo Corps of Engineers inquired as to the impacts of elevating the Bird Island Pier with concrete topping to effect safety improvements. Dr. Zeitlin noted that Bird Island Pier has already been modified on several occasions and he believes that some of these modifications included the use of marine concrete, which appeared in Buffalo in the late 1880's. He further believes that the use of marine concrete to elevate the pier will have no adverse effect on the structure as an historical feature, as it has already been modified. The historical potential of the pier is more related to its role in the early developments in the harbor and less with its particular structural features.

Developments, such as breakwaters, may be difficult to access in terms of inclusion to the NRHP (Bird Island Pier has special significance because of its age and durability). As piles of rock, timber, and concrete, breakwaters lack many of the architectural features associated with historic buildings or bridges (Fig. 34). The breakwaters derive their significance from the developments in the harbor they enabled by affording protection from the lake. An alternative approach to reviewing the significance of these structures might be the creation of a thematic nomination for harbor structures including the North and South Breakwaters, the Old Breakwater, the

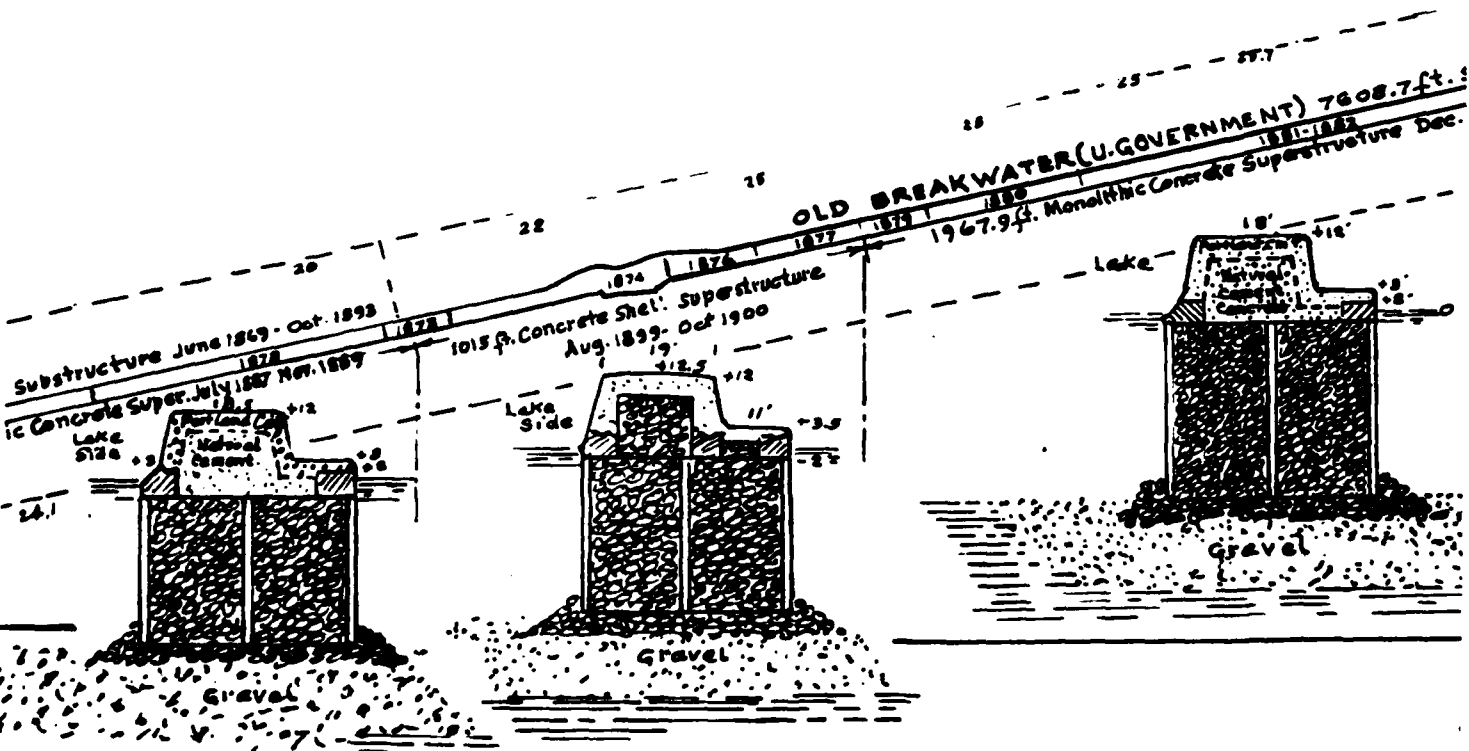
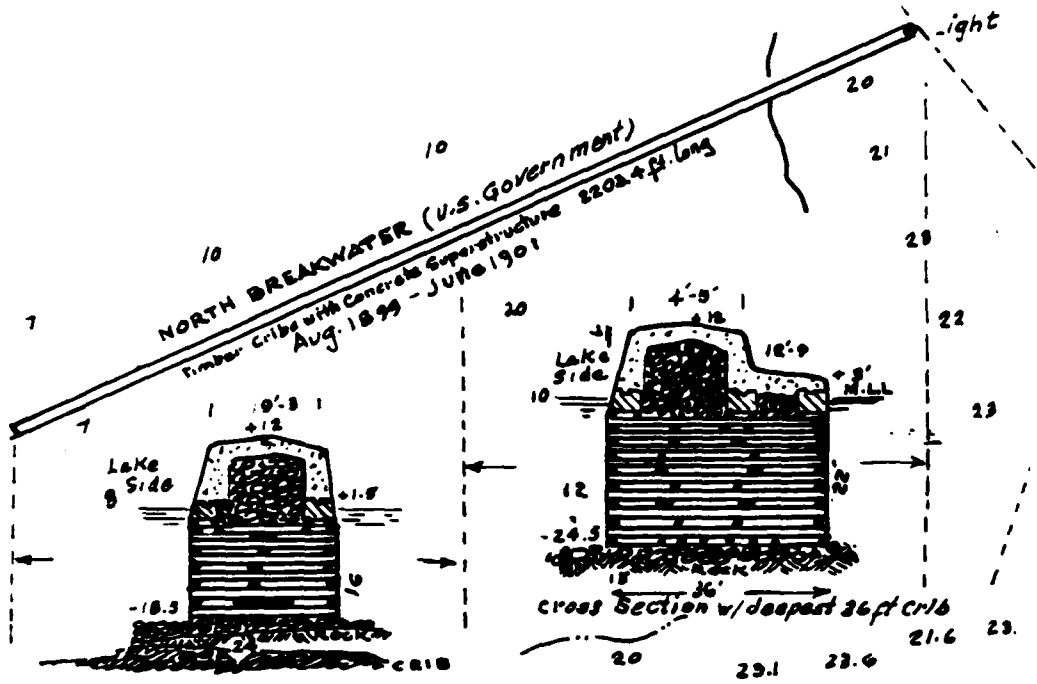


Fig. 34 - Construction Techniques for the North Breakwater and the Old Breakwater (Jones Map 1981)

New York State Breakwater, the Bird Island Pier and associated lighthouses.

It would not appear that any of these structures are immediately endangered by the proposed project. However, some consideration should be given to these sites if they may be damaged by changes in wave or tidal characteristics due to the proposed work.

Numerous historic and potentially historic structures are located within a few kilometers of the project area. Many of these qualify for, or have already been placed on, the NRHP. Some of these are listed in Appendix #3.

None of these structures lie in the project or should be secondarily impacted by the proposed work. The closest structure may be the Cargill Pool Elevator which has already been discussed. This reinforced concrete building is one of many built in the waterfront area. It does not appear to be unusual in design nor is it particularly old relative to other grain elevators. This structure may derive some significance as the last grain elevator in the Outer Harbor area, however, Dr. Zeitlin believes that the Cargill Pool Elevator does not qualify for inclusion on the NRHP.

As noted, over fifty known shipwrecks have occurred in the Buffalo Harbor or the immediate vicinity. Of these, eight have relatively specific proveniences.

The J.W. Cramer was a small steamer of only 23 tons which sank on Horseshoe Reef in 1884. The Myrtie was a 25 ton schooner sunk in 1907 in the same general location. It is assumed that either of these vessels could be in proximity to the proposed project area.

The B.B. McColl was a steamer of 489 tons which burned at the McColl Bros. Inc. dock in 1928. It is not known if the vessel burned to the waterline, but it was listed as a major insurance loss. It is unlikely that this vessel was sunk in the project area.

The Troy was a steamer which exploded and burned off of Black Rock in 1850. There were 22 fatalities associated with the loss of the vessel. The river in the vicinity of Black Rock is in the study area. Two problems are associated with this wreck. One is the question of how much of the wooden vessel survived the explosion and the burning. The second question pertains to the exact location of the wreck site.

The Keystone State was an oil screw vessel which sank in 1952 at the Great Lakes Dock and Dredge Co. at the foot of Katherine St. (Fig. 33). This vessel is not in the project area.

Two vessels, the Inter-Ocean and the C.H. Young were listed as being underwater near the entrance to the Erie Basin. The source on these vessels is the 1909 report on the Buffalo Har-

bor by Colonel W.L. Fisk, U.S. Engineer. As such, these vessels are in the project area. Unfortunately, no additional information could be obtained for these vessels. Their size, nature of design, cargo and port of origin are unknown, as are the reasons for their loss.

The Inter-Ocean and the C.H. Young are not listed in any standard works on Great Lakes wrecks. The Maritime Administration checked their computer files for records on the two vessels. Nothing was found, but they also noted that their files are deficient for vessels sunk before 1870 and being less than 1,000 tons. The author was then referred to the Office of Naval Intelligence. They indicated that they had no significant records on such vessels and neither did the Coast Guards offices for Buffalo Harbor.

Thus, these two vessels remain mysteries. They may even be small, private vessels. It is possible that a search through newspaper files could supply some information which would perhaps direct investigators to company or insurance files.

The last vessel is the Falmouth. A schooner of 234 tons, the Falmouth sank at the "new breakwater" in 1880. This vessel may have gone down near the Old Breakwater (Fig. 33).

All of these vessels have several things in common. They are generally small vessels, especially the J.W. Cramer and the Myrtie. With the exception of the B.B. McColl and the Keystone State, the locations of these vessels are still vague enough to make it unclear as to whether they are in the project area or, if so, exactly where within the confines of that area. With the exception of the Troy (lost 1850), the vessels date from the latter part of the 19th century or the 20th century (the dates of the sinking of the Inter-Ocean and the C.H. Young are not known but they were reported as lost by 1909).

It is difficult to provide recommendations for these vessels, especially as it is unsure if they are in the project area. A recommendation relative to the NRHP would have to consider a number of factors. These include the age of the vessel, its potential condition, its cargo, its design, the probability of its relocation and events associated with it.

Such information was not encountered in the course of this study. The information available largely pertained to the size, age and date of loss of the shipping. The author found some information on the size of the monetary loss associated with the wreck of a ship and loss of its cargo. The B.B. McColl burned and sank, which undoubtedly did extensive damage to the vessel. Considering where it sank, this vessel may have been raised for salvage, or to at least clear the dock. The Troy both exploded and sank in 1850. The effects on the wooden steamer are assumed to have been devastating.

Little other information is available on the rest of the vessels. They do not appear to be special in terms of their age, size, cargo (although not much is known on this point), design or the events surrounding their loss. It is interesting to note that of the 44 wrecks in the area in which the month of loss is known, 15 sank in November. This is perhaps a testament to the severe late Fall weather which hits the Great Lakes. Most of the vessels discussed and the other wrecks, are small steamers and schooners, typical of the vessels plying the Great Lakes in the latter part of the 19th century and the first half of the 20th century.

As noted, some of these vessels and some of the 44 other wrecks, may be encountered in the course of dredging. They are the cultural resources most likely to be impacted by the proposed project. If a wreck is encountered, work should stop until sufficient materials are recovered to allow a qualified marine historian or architect to attempt to assess whether the wreck may have potential for inclusion on the NRHP. Additional archival research may yield more data on the ships and their locations. This will require a significant time allotment to review newspaper accounts, insurance files and government records.

Another subject considered was the structures associated with the Erie Canal. The completion of the canal in the city of Buffalo was one of the major events in the history and development of the city. The canal has now been filled over almost all of its length and portions lie under the New York State Thruway. Various areas in Buffalo still have some association with the canal. These include Porter Avenue which uses original stone abutments and the old canal bridges, Days Point where the canal left the Niagara River to run inland into the city center, Bridge Street where a side lock permitted vessels access to the Niagara River and Austin Street where the last pair of locks on the canal were located (Daly and Ruggerio 1982: 102). None of these structures are in the project area.

The site of Fort Porter is in some proximity to the project area. The fort was named in orders on January 13, 1849, and was first occupied as a camp for volunteers to the Civil War in 1863. Garrisons of regular troops arrived in 1868 (Prucha 1964: 98-99). The fort structures were demolished in 1925 for the construction of the Peace Bridge (Daly and Ruggerio 1982: 102). The location of Fort Porter should not be affected by the proposed work.

CURATION

All materials associated with this project will be curated at the Offices of Archaeological Consulting and Services in Madison, Wisconsin. The curated materials include notes and photocopies of maps and other documents.

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Appendix #1 - Some Prehistoric Sites in the Project Area

Primarily Taken from Site Files at the Anthropology Department,  
State University of New York at Buffalo

Map Ref. - relates site to one of two maps showing locations

Appendix #1 - Prehistoric Sites in the General Project Area

| Site Name                  | Site No. | Map Ref. | Culture                            | Remarks  |
|----------------------------|----------|----------|------------------------------------|--|
| Lehde Nursery              | UB254    | B        | Euro-American                      | various Euro-American artifacts including ceramics |
| Weber                      | UB1816   | G        | Prehistoric                        |  |
|                            | UB599    | F        | Archaic/<br>Historic               | lithics and debitage<br>poss. reservation cabin    |
| Buffalo V&V'               | UB187    | E        | Prehistoric                        | approx. location only                              |
| Buffalo O'                 | UB180    | A        | Prehistoric                        |  |
|                            | UB1815   | C        | Early Woodland/<br>Middle Woodland | occupation site                                    |
| Buffalo 0-3                | UB503    | D        | Prehistoric                        | occupation site                                    |
| Buffalo V'                 | UB530    | H        | Prehistoric                        |  |
| Buffalo 0-4                | UB504    | I        | Prehistoric                        | occupation site                                    |
| Freight Branch<br>Railroad | UB286    | J        | Prehistoric                        | occupation site                                    |
| Buffalo 0-7                | UB712    | K        | Prehistoric                        |  |
| Jackberry's Town           | UB215    | L        | Historic                           | Reservation Period<br>123.                         |
| Mund                       | UB603    | M        | Prehistoric                        | debitage   |
| Buffalo Bible<br>Institute | UB213    | N        | Prehistoric                        | debitage   |

Appendix #1 (cont.)

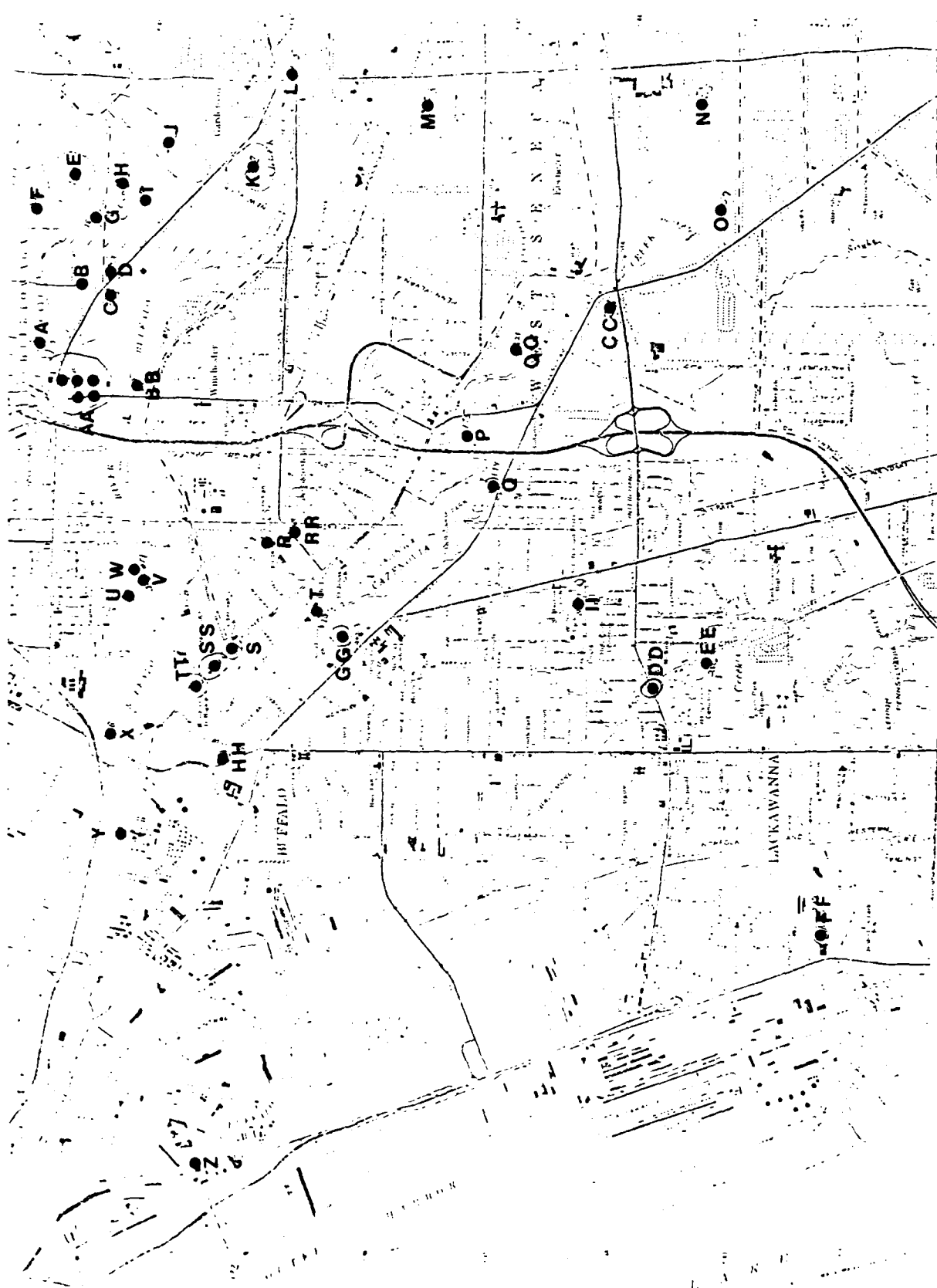
| <u>Site Name</u>       | <u>Site No.</u> | <u>Map Ref.</u> | <u>Culture</u>                   | <u>Remarks</u>                             |
|------------------------|-----------------|-----------------|----------------------------------|--|
| Ditch                  | UB257           | O               | Point Peninsula                  | lithic artifacts                           |
| Buffalo K'             | UB175           | P               | Late Archaic to<br>Late Woodland | location unsure                            |
| Buffalo K<br>Hart Farm | UB174           | Q               | Late Archaic to<br>Historic      | lithics, ceramics,<br>trade items, burials |
| Buffam St              |                 | R               | Late Woodland/<br>Historic       | major site - earthworks                    |
| Buffalo Y              | UB189           | S               | Prehistoric                      | exact location unknown                     |
|                        | UB170           | T               | Early Woodland/<br>Late Woodland | occupation sites -<br>copper stained bones |
| Buffalo Z              | UB190           | U               | Late Woodland/<br>Historic       | prob. destroyed                            |
| Barnard St.            | UB510           | V               | Late Archaic to<br>Late Woodland | occupation site - burials                  |
| Fenton St.             | UB219           | W               | Historic                         | village and cemetery -<br>destroyed        |
| Seneca Council         | UB218           | X               | Historic                         | Seneca Council House 124.                  |
| Buffalo X              | UB188           | Y               | Late Woodland or<br>Historic     | ceramics                                   |

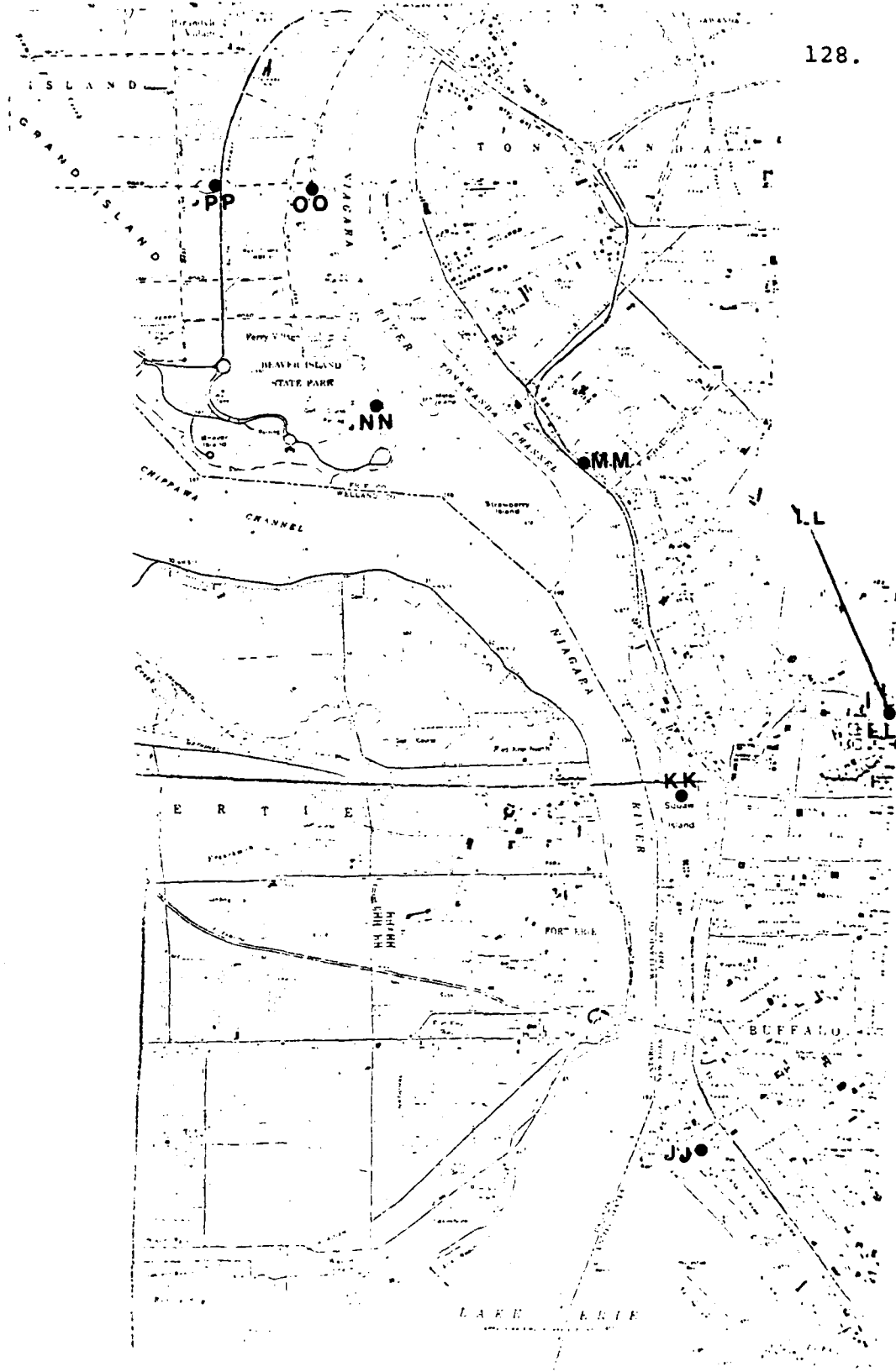
Appendix #1 (cont.)

| <u>Site Name</u>       | <u>Site No.</u> | <u>Map Ref.</u> | <u>Culture</u>              | <u>Remarks</u>                              |
|------------------------|-----------------|-----------------|-----------------------------|---|
| Buffalo I              | UB172           | Z               | Prehistoric                 |   |
| Buffalo O              | UB179           | AA              | Archaic to<br>Late Woodland |   |
| Orphanage              | UB256           | AA              |                             | site tested negatively                      |
| Buffalo 0-2            | UB502           | AA              | Prehistoric                 |   |
| Roesch                 | UB604           | AA              | Prehistoric                 | may be part of UB502 and<br>UB668           |
| Plaza                  | UB668           | AA              | Prehistoric                 | surface collection -<br>site graded         |
| Harlem Road Plaza      | UB255           | BB              | Prehistoric/<br>Historic    | lithics, debitage and<br>historic artifacts |
| Farthing Farm          | UB206           | DD              | Woodland                    | incised pottery                             |
| Holy Cross<br>Cemetery | UB236           | EE              | Prehistoric                 |   |
| Smokes Creek Site      | UB237           | FF              | Prehistoric                 |   |
|                        | UB2043          | GG              | Prehistoric                 |   |
| Buffalo D              | UB167           | HH              | Woodland                    | ceramics, lithics, debitage                 |
|                        | UB2044          | II              | Prehistoric                 |   |

Appendix #1 (cont.)

| Site Name               | Site No. | Map Ref. | Culture                            | Remarks   |
|-------------------------|----------|----------|------------------------------------|---|
| Buffalo F (Fort Porter) | UB169    | JJ       | Prehistoric/<br>Historic           | lithics and historic artifacts                  |
| Squaw Island            | UB281    | KK       | Prehistoric                        | one projectile point                            |
| Buffalo S               | UB183    | LL       | Prehistoric                        | location approximate                            |
|                         | UB235    | MM       | Prehistoric/<br>Historic           | destroyed                                       |
| Martin Site             | UB214    | NN       | Late Archaic to<br>Middle Woodland | large and productive occupation site            |
| Rusey Village           | UB453    | OO       | Early Woodland                     | site may have included a mound                  |
| Van Ostrand Site        | UB448    | PP       | ?                                  | site includes one house                         |
| Eaton Site              | UB221    | QQ       | Late Archaic/<br>Late Woodland     | <u>Lamoka points</u> and other artifacts        |
| Buffam St.              | UB228    | RR       | Late Woodland/<br>Historic         | see Map Ref. R - site reported in two locations |
| Armine St. Mound        | UB248    | SS       | Early or Middle Woodland           | probably destroyed                              |
| Buffalo B               | UB165    | TT       | prehistoric/<br>Historic           |   |





Appendix #2 - Shipwrecks in the Buffalo Area

Taken from Berman (1973), Hedin (1966), Winkelman (n.d.) and  
Daly and Ruggerio (1982)

| <u>Vessel Name</u> | <u>Rig</u>      | <u>Tons</u> | <u>Built</u> | <u>Date</u> | <u>Remarks</u>                                       |
|--------------------|-----------------|-------------|--------------|-------------|--|
| Starr              | Steam Sidewheel | 138         | 1837         | 1845        | burned - Buffalo Harbor                              |
| Tecumseh           | Steam Sidewheel | 203         | 1840         | 8/24/1850   | stranded - Buffalo, N.Y.                             |
| Troy               | Steamer         |             |              | 3/23/1850   | exploded and burned - off Black Rock - 22 fatalities |
| Two Brothers       | Schooner        |             | 1835         |             |  |
| U.S. 104           | Barge           | 306         | 1919         | 7/15/1921   | foundered - Buffalo, N.Y.                            |
| United States      | Steam Sidewheel | 366         | 1835         | 3/07/1849   | burned - Buffalo, N.Y.                               |
| Ursula             | Barge           | 177         | 1802         | 5/15/1923   | foundered - Buffalo River                            |
| Utica              |                 | 344         | 1846         | 1854        |  |
| W.C. Richardson    | Steam Screw     | 381         | 1902         | 12/08/1908  | foundered - Buffalo, N.Y.<br>5 fatalities            |
| W.W. Steward       | Schooner        | 294         | 1866         | 10/12/1909  | burned - Buffalo, N.Y.                               |
| Walk-on-the-Water  | Steam Sidewheel | 338         | 1818         | 11/01/1821  | stranded - Buffalo Harbor -<br>engines salvaged      |
| William Peacock    | Steam Sidewheel |             |              | 9/16/1830   | unknown - off Buffalo, N.Y.                          |
| 43                 | Barge           | 546         | 1911         | 5/24/1961   | foundered - Buffalo River<br>130.                    |
| Jerry Pe-rie       | Barge           | 462         | 1916         | 11/15/1925  | stranded - Buffalo, N.Y.<br>two fatalities           |
| John W. Cramer     | Steamer         | 23          |              | 10/17/1884  | sank on Horseshoe Reef<br>\$6000 loss                |

| Vessel Name         | Rig             | Tons | Built | Date       | Remarks   |
|---------------------|-----------------|------|-------|------------|---|
| Jordan boys         | Barge           | 405  | 1907  | 5/04/1945  | foundered - Buffalo, N.Y.   |
| Keystone State      | Oil Screw       |      |       | 1952       | unknown - Buffalo River at Great Lakes Dock and Dredge Co. at foot of Katherine St. |
| Maple Lake          | Schooner        | 135  |       | 11/13/1883 | sank 8 kilometers SE of entrance to Buffalo Harbor - \$11,000 loss                  |
| Marion              | Schooner        | 250  | 1841  | 1852       |   |
| Morania             | Barge           |      |       | 1951       | removed - Buffalo, N.Y.   |
| Myrtie              | Schooner        | 25   |       | 11/02/1907 | sank - Horseshoe Reef - \$6000 loss   |
| Northwest           | Steam Screw     |      |       | 6/03/1911  | burned - Buffalo, N.Y.  |
| Ohio                | Steam Screw     | 441  | 1848  | 11/1859    | exploded - Buffalo, N.Y.  |
| Rochester           | Steam Sidewheel | 472  | 1838  | 2/02/1853  | stranded - Buffalo, N.Y. - 7 fatalities   |
| Samon               | Steam Screw     | 250  | 1843  | 11/12/1852 | stranded - Buffalo, N.Y.  |
| Service             | Scow            | 169  | 1921  | 1/22/1958  | foundered - Buffalo River   |
| Shawmut             | Barge           | 250  | 1889  | 11/01/1889 | collided with America - Buffalo Harbor 131.   |
| Sherman V. Pettrrie | Barge           | 421  | 1914  | 11/15/1925 | stranded - Buffalo, N.Y. - 2 fatalities   |

| <u>Vessel Name</u>  | <u>Rig</u>  | <u>Tons</u> | <u>Built</u> | <u>Date</u> | <u>Remarks</u>  |
|---------------------|-------------|-------------|--------------|-------------|---|
| George King         | Steam Screw | 532         | 1874         | 9/20/1926   | burned - Buffalo, N.Y.  |
| George Rogers IV    | Steam Screw | 4010        | 1905         | 3/05/1923   | burned - Buffalo, N.Y.  |
| Gertrude Weightman  | Barge       | 254         | 1919         | 3/07/1941   | foundered - Buffalo, N.Y.   |
| Gilbert W. Benedict | Barge       | 447         | 1918         | 10/22/1930  | burned - Buffalo, N.Y.  |
| Governor Cushman    | Steam Screw | 384         | 1857         | 5/01/1868   | exploded - Buffalo, N.Y.<br>11 fatalities                             |
| Groton              | Schooner    | 352         |              | 11/24/1862  | 2.5 miles south of entrance<br>to Buffalo Harbor - \$12,500<br>damage |
| Hazel R. Knight     | Barge       | 236         | 1919         | 11/17/1927  | collided with F.W. Sargent -<br>Buffalo, N.Y.                         |
| Higginson Mfg.Co.4  | Steam Screw | 148         | 1905         | 11/17/1927  | burned - Buffalo, N.Y.  |
| Inter-Ocean         |             |             |              |             | listed as wrecked in 1909<br>at entrance to the Erie<br>Basin         |
| Island Belle        | Steam Screw | 121         | 1879         | 11/20/1930  | burned - Buffalo, N.Y.  |
| J.W. Doane          | Schooner    | 617         |              | 11/23/1882  | 400 meters NW of entrance<br>to Buffalo Harbor - \$38,000<br>loss     |
| James F. Cahill     | Barge       | 396         | 1914         | 9/12/1928   | burned - Buffalo, N.Y.  |

| <u>Vessel Name</u> | <u>Rig</u>      | <u>Tons</u> | <u>Built</u> | <u>Date</u>               | <u>Remarks</u>                                       |
|--------------------|-----------------|-------------|--------------|---------------------------|--|
| Acme               | Steam Screw     | 58          | 1893         | 4/15/1902                 | collided with Wilkesbarre off Buffalo Breakwater     |
| Ada Madora         | Schooner        | 290         | 1867         | 10/06/1906                | stranded - Buffalo, N.Y.                             |
| Alabama            | Steam Sidewheel | 799         | 1849         | 8/28/1854                 | foundered - Buffalo, N.Y.                            |
| Anna O'Connor      | Barge           | 447         | 1923         | 11/15/1925                | foundered - Buffalo, N.Y.<br>1 fatality              |
| B.B. McColl        | Steamer         | 489         |              | 7/27/1928                 | burned at McColl Bros. Inc. Dock                     |
| C.H. Young         |                 |             |              |                           | loss reported in 1909 in Erie Basin                  |
| Chicago            | Steamer         |             |              | 8/01/1849                 | burned - Buffalo Harbor<br>loss of \$100,000         |
| City of Buffalo    | Steam Screw     | 2026        | 1857         | 7/30/1866                 | burned - Buffalo, N.Y.                               |
| Commodore Perry    | Steam Sidewheel |             |              | 7/07/1835<br>or 7/12/1835 | exploded - off Buffalo, N.Y.                         |
| Dacotah            | Steam Screw     | 698         | 1857         | 11/23/1860                | stranded - Buffalo Harbor<br>24 fatalities           |
| Falmouth           | Schooner        | 234         |              | 11/21/1880                | sank at new breakwater in Buffalo - loss of \$50,000 |
| General Parker     | Steam Sidewheel | 342         | 1834         | 9/27/1847                 | stranded - Buffalo, N.Y.                             |

Appendix #3 - Location of Some Historical Sites and Structures in the General Vicinity of the Project Area

Taken from the Coastal Zone Management Program, 1977, and the Erie and Niagara Counties Regional Planning Board

## SITES OF HISTORIC IMPORTANCE

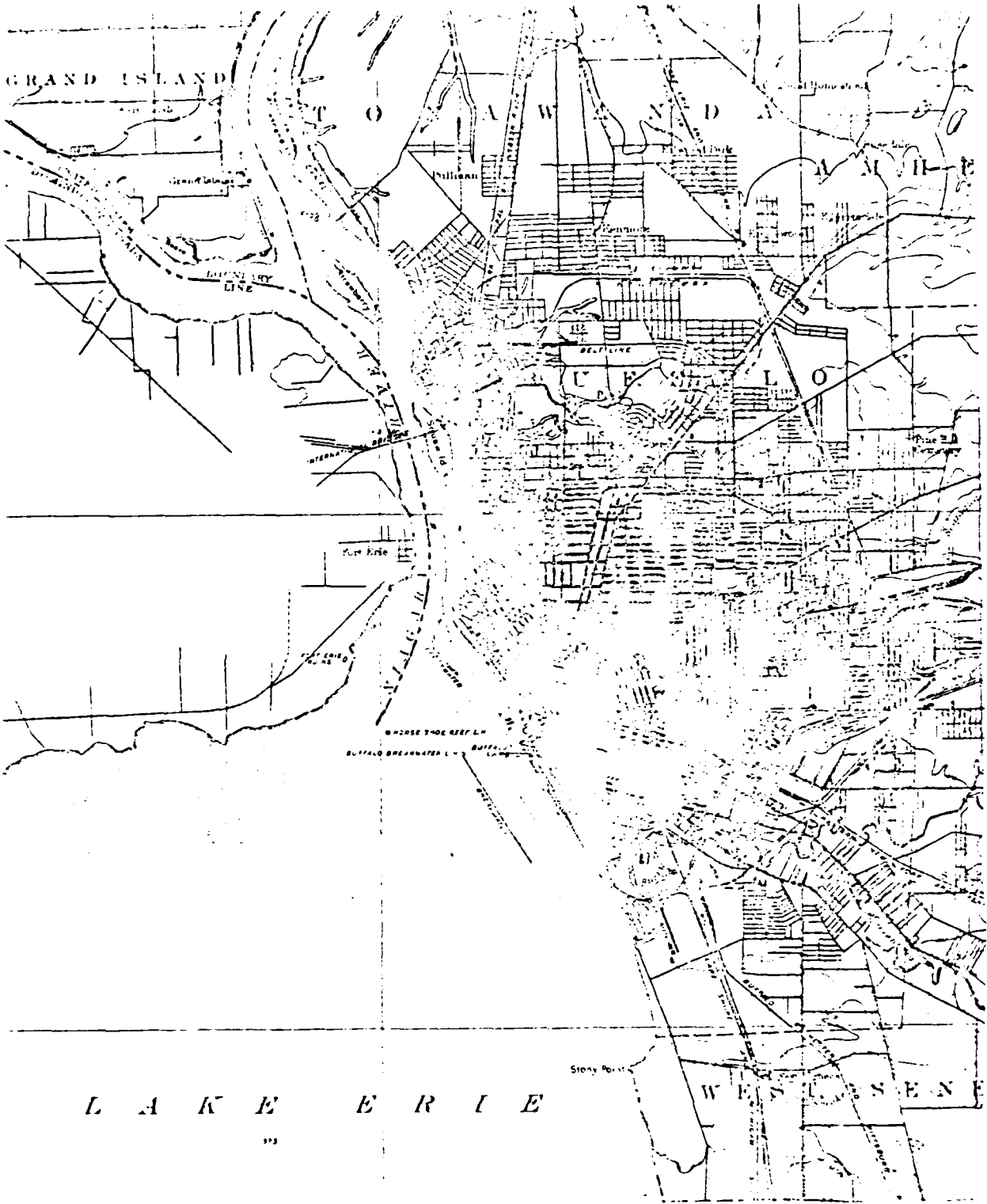
1. Fenian Raid - 2192 Niagara Street (Jafco Marine Restaurant). At this site, the Fenians embarked for Canada on May 31, 1866, in the cause of independence for Ireland.
2. Old Navy Yard - 1700 Niagara Street. At this site, five of Commodore Perry's ships were reconditioned for his victory on Lake Erie against the British in 1813.
3. Battle of Black Rock - Niagara and Tonawanda Streets. Site of one of the major land battles in Western New York during the War of 1812.
4. International Railroad Bridge - Niagara and Bridge Streets. This bridge crossing the Niagara River was built by Sir Casimer S. Gzowski in 1870-1873.
5. The Griffin - first ship to sail the upper Great Lakes, was outfitted at Squaw Island.
6. The Black Rock Shipyard - Commodore Perry had ships built here in 1815.
7. General Peter B. Porter House - Built in 1816 for nationally known General, Peter B. Porter.
8. Thomas Flyer Automobile - 1200 Niagara Street. Famous world record holding automobile built here in 1903-1911.
9. Orrin Strickney House - 1207 Niagara Street. Built 1819-1820. Considered oldest building in Buffalo.
10. Fort Tompkins - 1010 Niagara Street. Largest and most important fortification in Buffalo, during War of 1812.
11. Black Rock - Niagara and Busti Avenue. The black rock, a huge two-hundred foot by three-hundred foot dark limestone natural pier, part of the original harbor, extended four feet above the Niagara River.
12. Fort Porter - Customs Station. Built to defend the Niagara Frontier in 1844 against British attacks. Demolished in 1926 to make way for the Peace Bridge.

13. O.H. Perry Monument - In honor of Oliver Hazzard Perry, the victor against the British in 1813 Battle of Lake Erie.
14. 100th Regiment Boulder - Front Park. Commemorates the 100th regiment, New York volunteers, who served in the Civil War.
15. Buffalo Yacht Club - 3 Porter. Founded 1860, the third oldest yacht club in the United States.
16. Birge Company - 390 Niagara Street. One of Buffalo's largest industries founded in 1834.
17. Colonel Ward Pumping Station - Monumental building built in 1916, suggested for museum.
18. 1833 Buffalo Lighthouse - Chinaman's Lighthouse. The third and most significant lighthouse in the development of the Buffalo Harbor.

Appendix #4 - Some Additional Maps of the Project Area  
and Adjacent Lands

- 1) Proposed Harbor Improvements, 1836 (from Smith 1884)
- 2) Buffalo Area on 1894 U.S.G.S. Map
- 3) Black Rock General Map 1870 (from Baxter and Heyl 1965)
- 4) Black Rock Harbor Map 1903 (from Baxter and Heyl 1965)
- 5) Index Map - Lake Erie Entrance to Black Rock Harbor and Erie Basin, N.Y. (Annual Report for 1903, U.S. Army Corps of Engineers)
- 6) Buffalo Harbor, N.Y. and Lake Erie Entrance to Black Rock Harbor and Erie Basin, N.Y., June 1911 (U.S. Army Corps of Engineers)
- 7) Buffalo Harbor, N.Y. and Lake Erie Entrance to Black Rock Harbor and Erie Basin, N.Y., June 1913 (U.S. Army Corps of Engineers)
- 8) Buffalo Harbor, N.Y. (U.S. Army Corps of Engineers, 1915)





L A K E E R I E

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APPENDIX #1

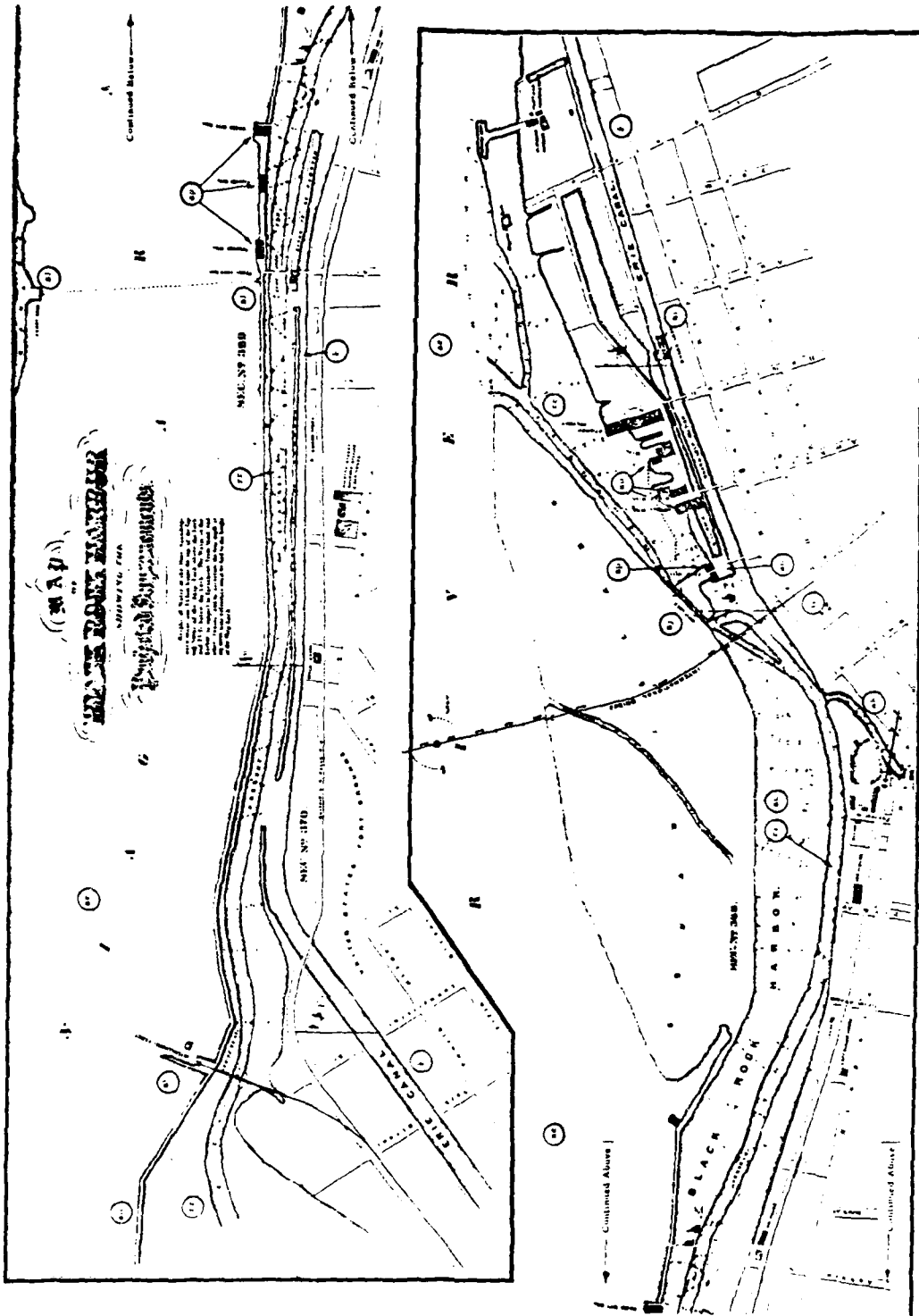
MAP 2

Black Rock General Map 1870  
From Canal Commissioners Report of 1871

- |  |  |
|--|--|
| (F) Erie Canal   | (al) Ferry landing to Fort Erie in use until after World War II  |
| (fr) Black Rock Channel  | (am) Bird Island Pier  |
| (ab) Railroad Car Ferry Landing to Fort Erie - Grand Trunk R. R. (B. & L.H. R. R.)         | (an) Lock at head of Mill Race. 1824 Ship Lock from Black Rock Harbor to Niagara River                           |
| (ac) Black Rock Harbor   | (ao) Water powered flour mills. Large quantity of water used by these mills disturbed water levels in Erie Canal |
| (ae) Niagara River   | (ap) Erie Flour Mill - refer to photo  |
| (ai) Double Lock #72 of Enlarged Erie Canal (Guard Lock)                                   | (ar) International Bridge, Grand Trunk R. R.   |
| (aj) Slip Lock Black Rock Harbor to Niagara River. Superseded in 1906 by present lock (ag) |  |
| (ak) Scajaquada Creek - Navigable for short distance and site of early shipyards           |  |

Area #1

Map No. 1870



Appendix #4

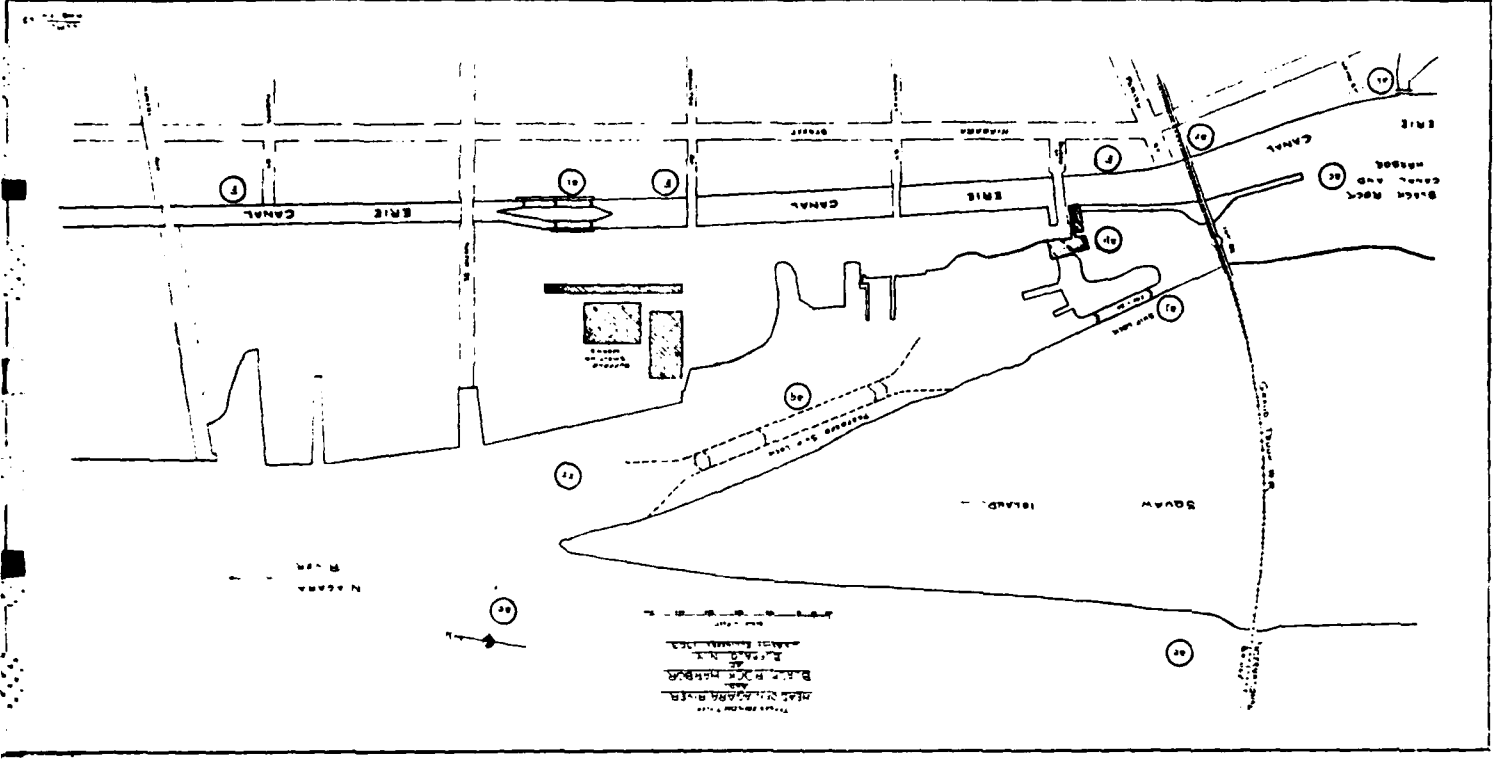
Page 3

**1903**

- (F) Erie Canal
- (rr) Black Rock Channel
- (ac) Black Rock Harbor
- (ae) Niagara River
- (a<sup>i</sup>) Double Lock #72 of Enlarged (1836-62) Erie Canal. 110' x 18' x 7' depth for barges of 250 ton capacity. Lengthened in 1884 to handle 2 barges in tandem. A Clinton's Ditch Lock built 1825, 90' x 15' x 4' depth, was located near here. (75 ton barges). These were guard locks but due to variations in elevation of Lake Erie, there could be a lift of up to 14'. Gates at this point controlled the flow of water that supplied the canal to east of Rochester.
- (aj) Snip Lock 200' x 36'. A small lock completed 1824 preceded this lock and formed a functional part of the 1st Welland Canal until 1833.
- (ak) Scajaquada Creek
- (ap) Erie Flour Mill - See picture
- (aq) Snip lock proposed 1903 and completed 1906. Still in use. As now planned, All America Canal will include a lock west of this location and sized 1000' x 100' x 35' depth
- (ar) International Bridge

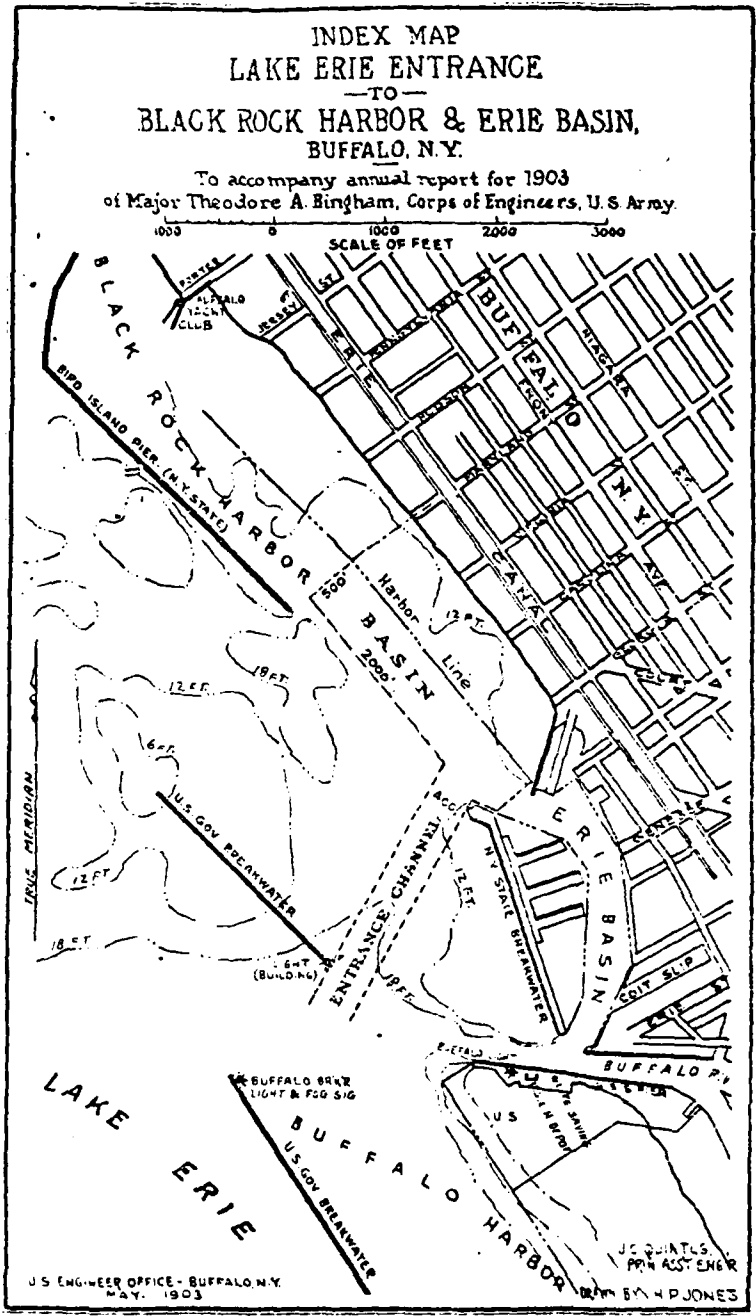
Am. Can. Co.

Am. Can. Co.

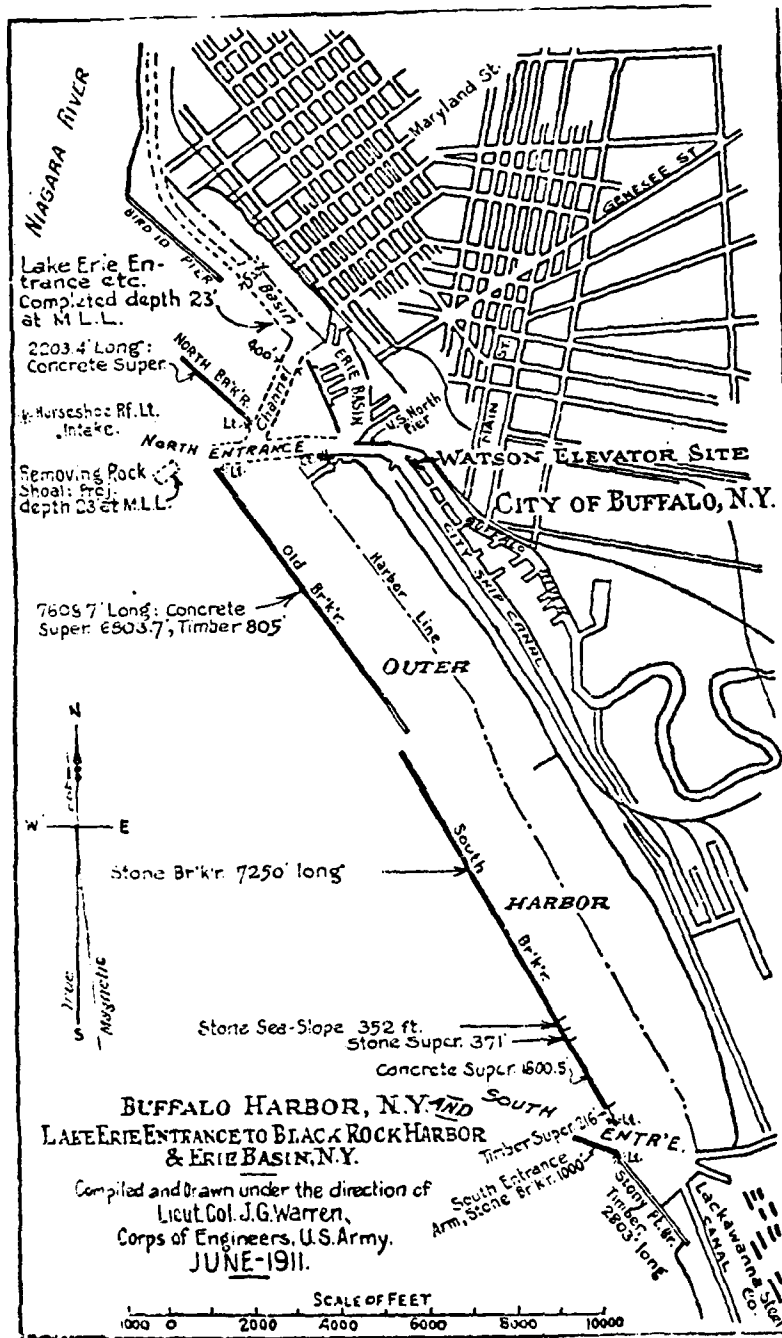


Appendix #1

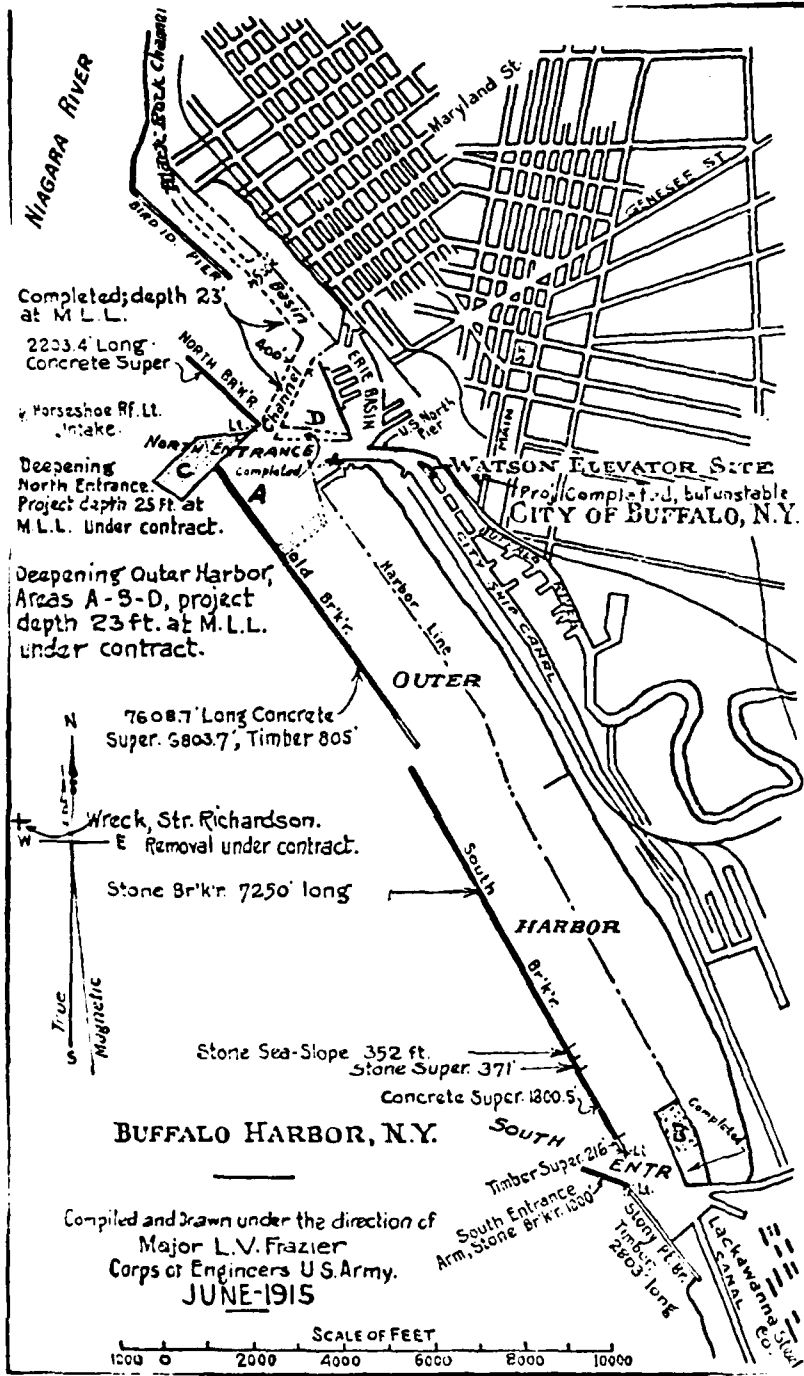
Map



Amalgam  
Map







1000 0 2000 4000 6000 8000 10000

Appendix #5

Potential Alternatives Considered in the Buffalo Harbor  
Study (U.S. Corps of Engineers, Buffalo District, Vol.I 1982)

of commercial navigation projects for which initial construction funding is received on or after 1 October 1981.

#### ALTERNATIVES CONSIDERED

a. Stage 1. During Stage 1 of this feasibility study, consideration was given to a full range of alternatives for moving bulk cargo to and from industries served by Buffalo Harbor. In general, these alternatives range from modifications to the existing harbor for more economical direct waterborne movements, to plans for various land modes of transportation for all or part of the bulk cargo movements.

A complete nonstructural alternative was not developed as such a plan would not fully satisfy the commercial navigation objectives. During the course of this feasibility study, nonstructural plans may develop and must be given full consideration.

In addition to an alternative to maintain the current harbor with no further improvements, 15 structural harbor modifications and transshipment alternatives and combinations thereof were investigated during the reconnaissance study effort. Generally, these alternatives fell into the following categories.

(1) River Improvements for 1,000-Foot Vessels - Due to the physical characteristics of a 1,000-foot vessel, most of the specific alternatives under this category of improvements call for the existing river channel to be realigned.

Alternatives Ia through If were developed to enable 1,000-foot vessels to enter the Inner Harbor. These alternatives were as follows:

- Ia. (Figure 9) The southern section of the Outer Harbor would be deepened, and the Buffalo River would be rerouted through the NFTA Small-Boat Harbor to the ConRail Corporation Bridge. A turning basin would be constructed using a segment of the existing river channel.

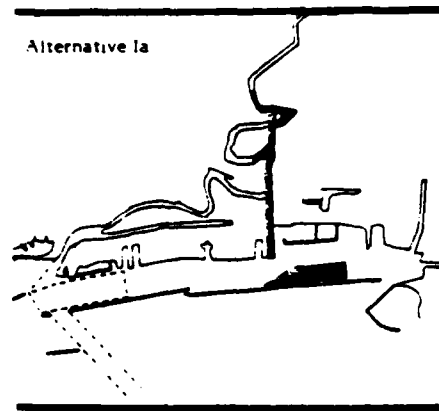


Figure 9

- Ib. (Figure 10) The southern section of the Outer Harbor would be deepened. The Buffalo River would be rerouted through the Allen Boat Company slip to the existing channels, and from there to the ConRail Bridge. A turning basin would be constructed using a segment of the existing river channel.

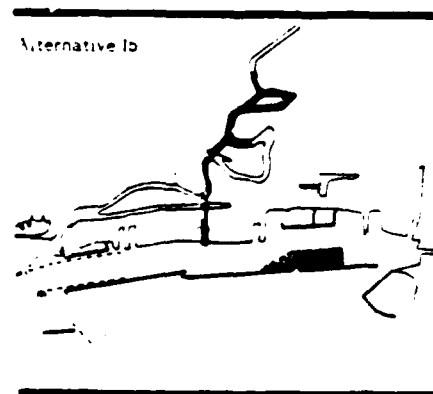


Figure 10

- Ic. (Figure 11) The North Entrance Channel and the northern section of the Outer Harbor would be deepened. The Buffalo River would be improved from the entrance channel to the ConRail Bridge. A turning basin using a segment of the existing river channel is also included in this alternative.

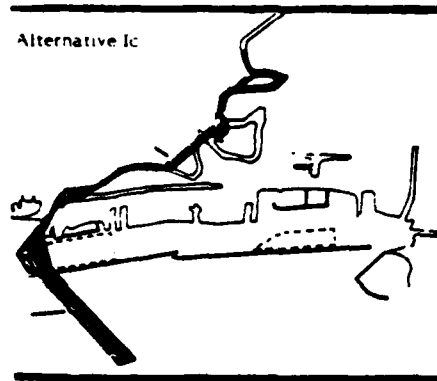


Figure 11

- Id. (Figure 12) The North Entrance Channel and the northern section of the Outer Harbor would be deepened. The Buffalo River and Buffalo Ship Canal would be improved, and a new channel would be constructed from the canal to the river. A turning basin would also be included.

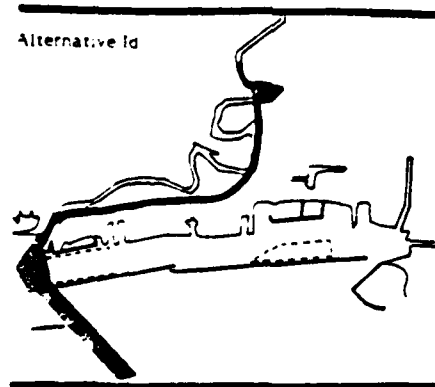


Figure 12

- Ie. (Figure 13) The North Entrance Channel and the northern section of the Outer Harbor would be deepened. The Buffalo River would be improved from the Entrance Channel to the Ohio Street Bridge, and the Buffalo Ship Canal would also be improved.

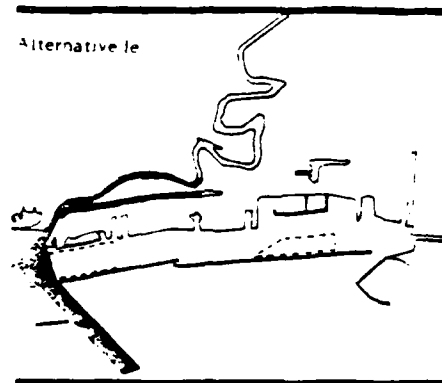


Figure 13

- If. (Figure 14) The North Entrance Channel and the northern section of the Outer Harbor would be deepened. The Buffalo River Entrance Channel, the Buffalo River, and the Buffalo Ship Canal would all be improved, and a new channel would be constructed between the river and ship canal.

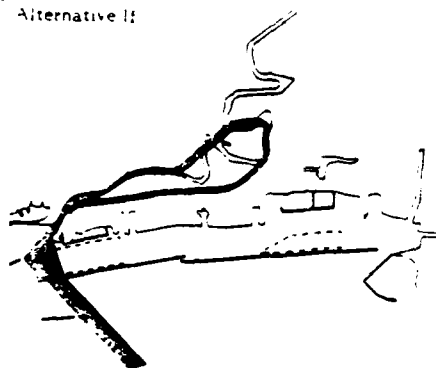


Figure 14

Economic analysis of these six alternatives are displayed in Table 17 and revealed cost estimates ranging from \$83 million for Alternative Ie to \$293 million for Alternative Ib. Economic analyses of the alternatives did not show benefit to cost ratios greater than one. The largest ratio was 0.86 for Alternative Ie.

Table 17 - Estimated Construction Costs (1) and Benefit/Cost Ratios

| Alternative Scheme | First Cost (1) | Benefit/Cost Ratio |
|--------------------|----------------|--------------------|
|                    | \$             |                    |
| Ia                 | 195,160        | 0.30               |
| Ib                 | 293,035        | 0.49               |
| Ic                 | 207,490        | 0.44               |
| Id                 | 201,700        | 0.61               |
| Ie                 | 83,390         | 0.86               |
| If                 | 241,235        | 0.39               |
| IIa                | 39,570         | 3.21               |
| IIb                | 37,780         | 2.22               |
| IIc                | 24,690         | 1.75               |
| IIIa               | 33,610         | 3.43               |
| IIIb               | 27,880         | 4.19               |
| IIIc               | 15,068         | 3.51               |
| IIId               | 23,525         | 2.16               |
| IIIe               | 4,050          | 0.66               |
| IV                 | 15,430         | -                  |

(1) Thousands of 1980 dollars.

Environmental impact analysis of the alternatives indicated that channel realignments would produce a direct loss in terrestrial habitat and degradation of the aquatic habitat and water quality. Deepening and widening efforts would degrade water quality and aquatic biology, and problems would be encountered in the deposition of dredged materials.

(2) River Improvement for 700-Foot Vessels - Due to the physical characteristics of the smaller 700-foot vessels, all of the specific alternatives under this category of improvements require only that the existing channel be deepened.

Deepening measures for the Inner Harbor are addressed in Alternatives IIa, IIb, and IIc. These measures consider deepening and do not include channel realignment efforts.

- IIa. (Figure 15) The North Entrance Channel, the northern section of the Outer Harbor, the Buffalo River Entrance Channel, the Buffalo River (to Republic Steel), and the Buffalo Ship Canal would all be deepened. A turning basin would be constructed at the upper end of the channel improvements.

Alternative IIa

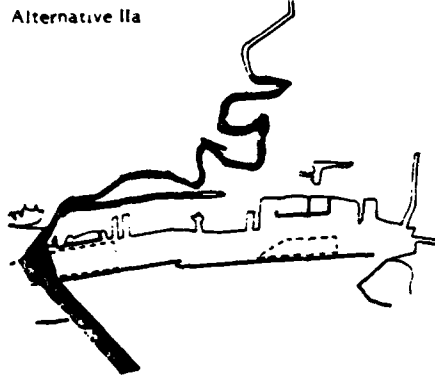


Figure 15

- IIb. (Figure 16) The North Entrance Channel, the northern section of the Outer Harbor, the Buffalo River Entrance Channel, and the Buffalo River (to the ConRail Bridge) would all be deepened.

Alternative IIb



Figure 16

- IIc. (Figure 17) The Northern Entrance Channel, the northern section of the Outer Harbor, the Buffalo Entrance Channel, and the Buffalo Ship Canal would all be deepened.

Alternative IIc

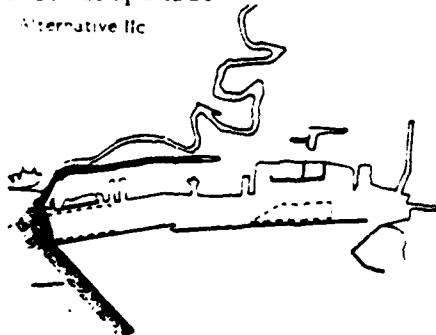


Figure 17

Economic analysis of the three deepening alternatives (Table 17) revealed costs ranging from \$25 million for Alternative Iic to \$40 million for Alternative Iia. Alternative Iia, which deepens the Buffalo Ship Canal and Buffalo River to Republic Steel, has a B/C ratio of 3.21. Other deepening alternatives also had B/C ratios above unity. The deepening of the Ship Canal may not result in significant benefits because the canal might still be unable to accommodate larger vessels. The problem needs to be subjected to further study. However, savings are accrued from fully loading the present vessels using the ship canal.

Environmental impact analysis of the alternatives indicated that deepening would have adverse effects on water quality and aquatic biology. Further, concern was expressed as to associated problems with bank stabilization. Problems would be encountered with the deposition of dredged materials.

(3) Transshipment from the Outer Harbor to Upriver Industrial Facilities - Alternatives IIIa through IIIe involve various transshipment modes such as conveyors, pipelines, and barges that would take bulk cargoes offloaded from large vessels in the Outer Harbor and transport them to various points in the Inner Harbor. These alternatives, which would avoid the very large costs connected with the channel realignment alternatives, are as follows:

- IIIa. (Figure 18) The southern section of the Outer Harbor would be deepened, and a grain conveyor system would be built from the Outer Harbor that would serve General Mills, Pillsbury, Peavey, International Multifoods, and Standard Milling.

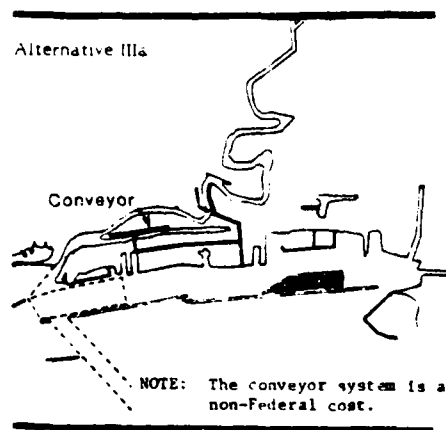


Figure 18

IIIb. (Figure 19) The Seaway Pier Number 2 slip would be deepened, and a conveyor system would be built from the Number 2 slip to General Mills, Pillsbury, Peavey, International Multifoods, and Standard Milling.

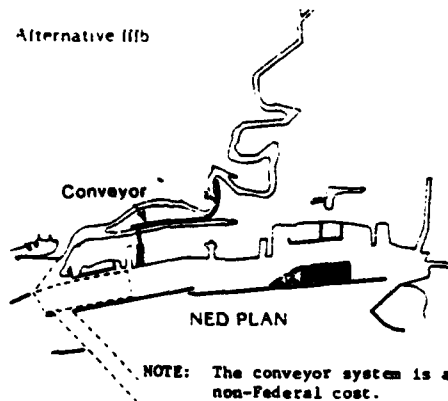


Figure 19

IIIc. (Figure 20) The southern section of the Outer Harbor would be deepened, and ore would be transported through a slurry pipeline to Republic Steel.

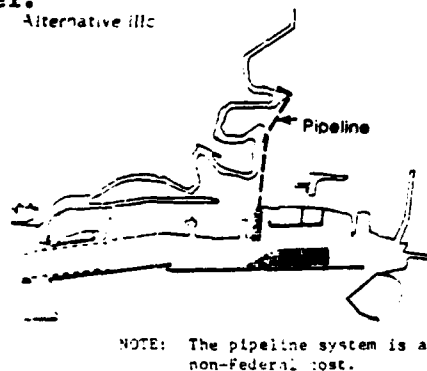


Figure 20

IIId. (Figure 21) The southern section of the Outer Harbor would be deepened, and ore and limestone would be carried to Republic Steel by a conveyor.

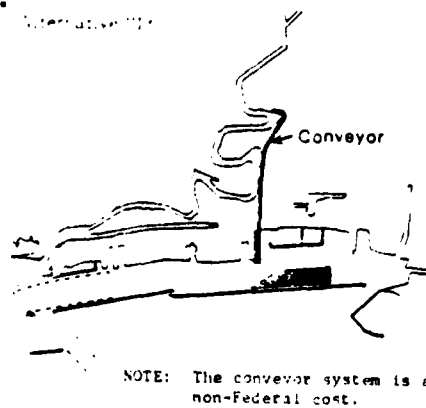


Figure 21

IIIe. (Figure 22) The southern section of the Outer Harbor would be deepened, and two barges would be used to transport limestone and iron ore upstream.

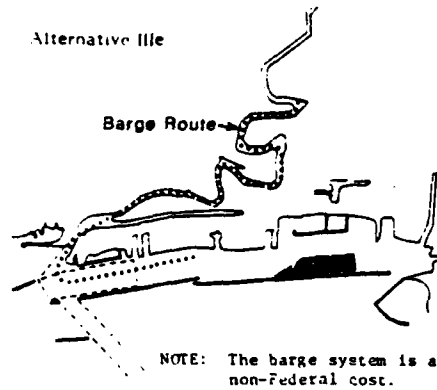


Figure 22

Cost estimates of these alternatives (Table 17) revealed costs ranging from \$4 million for Alternative IIIe to \$34 million for Alternative IIIa. Economic analyses indicate benefit to cost ratios greater than one, except Alternative IIIe. These schemes were evaluated based on Principles and Standards criteria and on original construction cost amortization of 50 years. Since a large part, if not all, of the construction costs for transshipment alternatives must be borne by private companies, more appropriate business criteria must be considered to determine the likelihood of private participation.

The best B/C ratio (4.19) for grain conveyor transshipment is Alternative IIIb. Both ore transshipment alternatives produced high B/C ratios, with the best (3.51) being for the slurry pipeline. Use of barges yielded a B/C ratio of 0.66.

There would be very little environmental impact from these alternatives. Components of these alternatives that could possibly affect physical and biological resources would include management practices to prevent spills and other accidents, actual alignment of the conveyor and pipeline systems, quality and quantity of shipments, and the ability to remove iron ore particles from the slurry before discharging wastewater into the river.

(4) Improvements to the South Entrance Channel - Alternative IV (Figure 23) involves the deepening of the southern section of the Outer Harbor, the removal of a portion of the south breakwater, widening and deepening of the South Entrance Channel, and construction of a new breakwater on the south side of the South Entrance Channel. This alternative, which would make the entrance channel safer for large vessels, was not analyzed in detail.

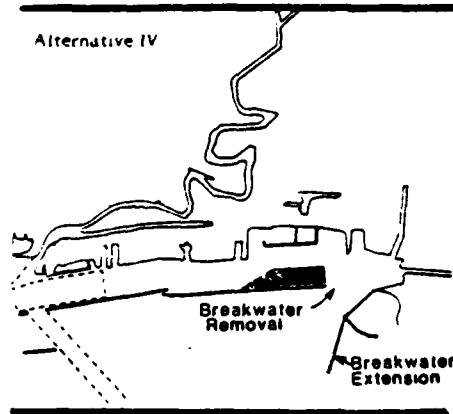


Figure 23

(5) Conclusions - On the basis of the concerns, needs, and desires expressed by local interests and the preliminary economic and environmental studies presented in Stage 1, it was concluded that all categories of improvements were feasible except for the "River Improvements for 1,000-Foot Vessels."

Alternatives recommended for Stage 2 study were as follows:

II River Improvements for 700-Foot Vessels

IIa - Deepen Buffalo River and Ship Canal

IIb - Deepen Buffalo River only

IIc - Deepen Buffalo Ship Canal only

III Transshipment from the Outer Harbor to Upriver Industrial Facilities

IIIa - Grain conveyor system

IIIb - Grain conveyor system

IIIc - Slurry pipeline for iron ore

IIId - Conveyor System for iron ore

IV Improvements to the South Entrance Channel for 1,000-Foot Vessels

IV Channel Modifications

b. Stage 2.

(1) Nonstructural Plans - Since no nonstructural solutions were identified during Stage 1, some were formulated during Stage 2, but after a

VITAE

PHILIP H. SALKIN

PII Redacted

EDUCATION BACKGROUNDWinter, 1983 or Spring,  
1984Dissertation Defense, "Prehistoric  
Adaptations in the New Milford Area  
of the Housatonic Valley, Western  
Connecticut"

February, 1972 - May, 1982:

University of Wisconsin-Madison  
3/75: Defence of Dissertation Pro-  
posal  
12/74: Defense of MA Thesis  
Awarded 5/75  
4/73: MA/PhD Exams passed at High  
Level

September, 1968 - December, 1971:

S.U.N.Y. at Binghamton  
B.A. in Social Science (Anthro.)  
Certificate in Medieval Study

1965-1968:

Suffern High School, Suffern, N.Y.  
Regents DiplomaFIELD EXPERIENCE

1980-1983:

Principal Investigator. Numerous  
Surveys, Testing and Excavation Pro-  
grams in Wisconsin, Minnesota, Iowa  
and New York for Archaeological Con-  
sulting and Services

FIELD EXPERIENCE (CONT.)

- 1979: Principal Investigator. Numerous Surveys and Test Excavations in Wisconsin and Iowa for Archaeological Consulting and Services.
- Summer, 1979: Director. Lake Farms Archaeological Project.  
Director. University of Wisconsin-Whitewater Fieldschool
- 1978: Principal Investigator. Small Surveys in Wisconsin for Archaeological Consulting and Services.
- Summer, 1978: Survey in Minnesota and Wisconsin for U.S. Army Corps of Engineers, St. Paul District.
- Summer, 1977 Director. University of Wisconsin-Whitewater Fieldschool  
Principal Investigator. Small Surveys in Wisconsin for Archaeological Consulting and Services.
- Summer-Fall, 1976: Principal Investigator. Small Surveys in Wisconsin for Archaeological Consulting and Services.
- Summer, 1975: Director. Fieldschool in Housatonic Valley of western Connecticut.
- Summer, 1974: Director. Fieldschool in Housatonic Valley of western Connecticut.
- Summer, 1973: Assistant Anthropologist. Directed excavations at two sites in the Kickapoo Valley of Wisconsin. Completion of Malacological Project on Cedar Mesa, southeastern Utah.
- Summer, 1972: Project Assistant. Participated in Cedar Mesa Project, southeastern Utah for the Museum of Northern Arizona.
- Summer, 1971: Director. Survey, primarily in the Susquehanna Valley of New York for the N.Y.S. Museum and Science Service and S.U.N.Y. at Binghamton.

FIELD EXPERIENCE (CONT.)

Spring, 1971:

Field Assistant: Excavation of the Winkelman Site in Barton, New York for the N.Y.S. Museum and Science Service and S.U.N.Y. at Binghamton.

Summer, 1970:

Crew Member: Survey and excavation in the Susquehanna Valley of New York for the N.Y.S. Museum and Science Service and S.U.N.Y. at Binghamton.

RELATED EXPERIENCE

1976-1982:

Developed Archaeological Consulting and Services (cultural resource management firm), becomes a partnership in 1980, undergoing incorporation in 1982.

1977-1981:

Developed the Archaeology Program at the University of Wisconsin-Whitewater including contract archaeology program, fieldschool and lab.

1972-1982:

Experience in analysis at the archaeological and environmental labs and computer facilities at the University of Wisconsin-Madison.

1972:

Curatorial Assistant in the historical collections of the State Historical Society of Wisconsin.

1970-1971:

Laboratory assistant at the archaeological laboratories of the S.U.N.Y. at Binghamton.

TEACHING EXPERIENCE

Academic Years, 1979-1981

Adjunct Assist. Professor, University of Wisconsin-Whitewater. Director of Archaeology Program.

Academic Year, 1978-1979:

Lecturer, University of Wisconsin-Whitewater. Director of Archaeology Program.

TEACHING EXPERIENCE (CONT.)

- Academic Year, 1977-1978: Visiting Assist. Professor. Marquette University.
- Academic Year, 1977-1978: Lecturer. University of Wisconsin-Whitewater. Director of Archaeology Program.
- Spring, 1977: Lecturer. University of Wisconsin-Whitewater.
- Spring, 1977: Lecturer. University of Wisconsin-Parkside.
- Academic Year, 1975-1976: Lecturer. University of Wisconsin-Parkside.
- Fall, 1973 - Spring, 1976: Teaching Assistant for five semesters at University of Wisconsin-Madison. Taught sections of Introduction to Anthropology.
- Spring, 1973: Taught two classes in method and theory in archaeology at East High School, Madison, Wisconsin.
- Spring, 1973: Lecturer on Wisconsin Prehistory for the State Historical Society of Wisconsin.
- Summers, 1974, 1975, 1977, 1979: Directed fieldschools in archaeology in Wisconsin or Connecticut.
- Spring, 1971: Assistant on fieldschool for S.U.N.Y. at Binghamton.
- 1978, 1980: Taught two classes on topics in archaeology for the University of Wisconsin-Extension.

PUBLIC SERVICE

- 1971-1981: Numerous speaking engagements on various topics in anthropology for public schools from kindergarten to college and for civic groups.

PUBLIC SERVICE (CONT.)

1979: Responsible for the enactment of an ordinance protecting archaeological sites on county land in Dane County, Wisconsin.

PUBLICATIONS

in press:

"The Prehistory of Dane County: A View of 12,000 Years. Dane County Regional Planning Commission.

1979:

"47Mq66: A Late Woodland Site in Montello, Wisconsin". The Wisconsin Archeologist. Vol. 60, No. 4. Pg. 330-349.

1976:

"Excavation of Earll Mound #1: Some Hypotheses on the Function of Vacant Mounds in the Effigy Mound Tradition". The Wisconsin Archeologist. Vol. 57, No. 3, Pg. 152-164.

1975:

"The Rose Rockshelter: An Effigy Mound Component in the Kickapoo Valley". The Wisconsin Archeologist. Vol. 56, No. 1. Pg. 55-71.

1975:

"The Malacology of the Kane Springs Column and the Paleoecology of Cedar Mesa, Southeastern, Utah". Canyonlands Country, ed. James E. Fassett. The Four Corners Geological Society. Pg. 73-79.

1974:

"The Malacology of the Kane Springs Column and its Relationship to the Prehistoric Adaptations to Cedar Mesa, San Juan County, Utah". Master's Thesis, University of Wisconsin-Madison.

REPORTS

1976-1982: Over Seventy reported on cultural resource management surveys, tests and excavations. Reports range from 10 to over 500 pages in length.

MANUSCRIPTS IN PREPARATION

"Ve502: A Multicomponent Site in Vernon County, Wisconsin" complete.

"The Archaeology of the Lake Farms National Historic District" first draft complete.

Site reports on three sites in western Connecticut.

PAPERS

- 1981: "The Lake Farms Archaeological District and the Early Woodland of South-central Wisconsin". Delivered at Annual Meeting of the Midwest Archaeological Society, Madison, Wisconsin.
- 1980: "A Preliminary Report on the Lake Farms Archaeological Project". Delivered at the Annual Meeting of the Central States Anthropological Society, Ann Arbor, Michigan.
- 1979: "The Position of Western Connecticut in the Prehistory of Southern New England". Delivered at the Annual Meeting of the Society of American Archaeology in Vancouver, B.C.
- 1977: "Archaeological Excavations in the Madison, Wisconsin Area". Delivered at the Annual Meeting of the Midwest Archaeological Society, Beloit, Wisconsin.

PAPERS (CONT.)

- 1975: "Archaeological Surveys in the Madison, Wisconsin Area". Delivered at a meeting of the Charles E. Brown Chapter of the Wisconsin Archaeological Society.
- 1974: "A Preliminary Report on the 1973 Excavations in the Kickapoo Valley, Wisconsin". Delivered with John Halsey at a meeting of the Charles E. Brown Chapter of the Wisconsin Archaeological Society.
- 1973: "The Cedar Mesa Project, Southeastern Utah". Delivered at a meeting of the Charles E. Brown Chapter of the Wisconsin Archaeological Society.
- 1971: "Cultural Stratification in Unstratified Soils". Delivered at the Annual Meeting of the New York State Archaeological Society, Binghamton, N.Y.

HONORS

- 1982: Grant for Computer Analysis. University of Wisconsin-Madison.
- 1979: Matching Funds Grant from the State Historical Society of Wisconsin for work in the Lake Farms Archaeological District.
- Spring, 1974: Ford Fellowship.
- Spring, 1972 - Spring, 1973: Tuition Remission Scholarship. University of Wisconsin-Madison.
- 1970-1971: Harpur Merit Scholarship. S.U.N.Y. at Binghamton.

HONORS (CONT.)

1968-1971:

N.Y.S. Regents Scholarship.  
Dean's List, all semesters at  
S.U.N.Y. at Binghamton.

ACADEMIC SOCIETIES

Member, Wisconsin Archaeological Survey  
Member, Wisconsin Archaeological Society  
Member, Wisconsin Academy of Arts, Letters and Sciences  
Member, Northeastern Anthropology Association  
Member, Central States Anthropology Association  
Member, Society for American Archaeology.

AREAS OF INTEREST AND/OR SPECIALIZATION

North American Archaeology with an emphasis on the Northeastern  
U.S. and Western Great Lakes  
Cultural Resource Management  
Environmental Archaeology with an emphasis on problems of  
Prehistoric Adaptations  
Cultural Ecology  
North American Ethnology and Ethnohistory  
Method and Theory in Archaeology.

REFERENCES

1. Dr. Walter Tiffany  
Anthropology Program  
University of Wisconsin-Whitewater  
Whitewater, Wisconsin 53190

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Height: 5' 7 1/2"  
Weight: 143

Education

- Ph. D. 1973, University of Wisconsin--Madison  
Major: American Diplomatic and Military History  
Advisors: Thomas J. McCormick and Edward M. Coffman  
Thesis: "Brass Buttons and Iron Rails: The U.S. Army and American Involvement in Mexico, 1868-1881."  
M.A. 1969, University of Wisconsin--Madison  
Major: History of the American West  
Advisor: Allan G. Bogue  
B.A. 1966, Queens College of the City University of New York, Flushing, NY

Professional Experience

- President, Historical Resources Inc., Waunakee, Wisconsin, June 1980-Present. \_\_\_  
Director, Chief Curator, Wisconsin Veterans Museums, Madison, Wisconsin, August 1979-Present.  
Historian I, State Historical Society of Wisconsin, 1976-1977, Old World Wisconsin Museum.  
Project Director, U.S. Office of Education grant, "Old World Wisconsin and Ethnic America," based at State Historical Society of Wisconsin, 1974-1976.  
Curator II, Research and Field Work, State Historical Society of Wisconsin, 1973-1974.  
Editorial Assistant, History of Wisconsin, Volume 1, State Historical Society of Wisconsin, 1971-1972 (part-time).  
Research Assistant, State Historical Society of Wisconsin, 1967-1969 (part-time).

Public Relations, Media and Convention Papers

- "Prospects and Pitfalls: Part-time Historical Consulting," 4th Annual Public History Convention, Chicago, IL, Apr. 1982, Chairperson.  
"The First Brigade Band," A CAMEOS Historical Television Drama, 1982-1983.  
"History as a Management Tool," Wisconsin Chapter, American Public Works Association Convention, Beloit, Wisconsin, Nov. 1981.  
"History for Hire," 3rd Annual Public History Convention, Raleigh, N.C., Apr. 1981.  
"History as an Empowering Force in Organizations," 2nd Annual Public History Convention, Pittsburgh, PA, Apr. 1980.  
"St. Friole Island Multiple Resource Historic District, Prairie du Chien, Wisconsin Historical Research," Society for Historical Archaeology Convention, Albuquerque, N.M., Jan. 1980.  
Producer and Photographer of "Immigration to Wisconsin: The German Experience," thirty minute slide/tape presentation for Wisconsin Public School System, Mar. 1976.

Teaching

- PACE Professor, Chapman College, Orange, CA, Dept. of History, Feb. - Apr. 1981, courses aboard forward deployed U.S. Naval vessel in Western Pacific,

Teaching (continued)

- "U.S. 1865-Present," "Contemporary World History." U.S.S. Berkeley (DDG-15).  
 Instructor, University of Wisconsin-Extension, Department of History and Liberal Studies, Adult, Continuing Education Courses, 1979-1980, History of Wisconsin series: "Glacier to Government," "Frontier Wisconsin," "Progressive Wisconsin," and "Wisconsin in Modern Times."  
 PACE Professor, Chapman College, Orange, CA, Dept. of History, May-Jun. 1979, courses aboard forward deployed U.S. Naval vessel in Western Pacific,, "American Values" and "Contemporary World Problems." U.S.S. Jason (AR-8).  
 Instructor, University of Wisconsin--Madison, Dept. of History and Institute for Environmental Studies, 1976-1978, inter-disciplinary course "Man in the American Environment."  
 Teaching Assistant, University of Wisconsin--Madison, 1969-1973.  
 "American Social History, 1865-Present"  
 "United States History, 1917-Present"  
 "History of American Radicalism in the 19th and 20th Centuries"  
 "History of the United States from Colonial Times to 1865"  
 "History of American Foreign Relations, 1900-Present"  
 "Military History of the United States"  
 "History of the United States, 1865-Present"

Consultant and Technical Reports

- Consultant, Pfaller-Herbst Associates, Milwaukee, WI, Community Planning Survey, Sturgeon Bay, WI, Nov. 1981-Jun. 1982.  
 Consultant, Mid-America Research Center, Chicago, IL, "White Deer Lake Camp," USDA, Ottawa National Forest, Ironwood, MI, Dec. 1980-Feb. 1981.  
 Consultant, Pfaller-Herbst Associates, Milwaukee, WI, Community Planning Survey--Trempeleau, Galesville, Whitcomb, Blair, Trempeleau County, WI. Oct. 1980 - Jun. 1981.  
 Historian, St. Friole Island Multiple Resource Historic District, Prairie du Chien, WI. Flood Damage Reduction Project, U.S. Army Corps of Engineers, St. Paul District, Historic Building Survey, 1979-1980.  
 Reader for National Endowment for the Humanities Museum Education Grants, 1978.  
 Consultant, Wisconsin Department of Transportation Highway 19 Enlargement Project. Historical Building Survey, May - Jul. 1978.  
 Historian, "The Ketola Farmstead Exhibit," Old World Wisconsin Museum, Mar. 1977.  
 Historian, "The Rankinen Farmstead Exhibit," Old World Wisconsin Museum, Nov. 1976.  
 Historian, "Finnish Institutions Exhibit, Old World Wisconsin Museum, Mar. 1976.  
 Consultant, Badger House Productions, Green Bay, Wisconsin ethnic heritage film strip series, 1977.  
 Consultant, Stevens Point, Wisconsin Public School Oral History Project, 1976.

Publications

- Old Abe's Regiment, State Historical Society of Wisconsin, (Madison, 1982) forthcoming.  
 "Campaigning in '64: The Civil War Letters of A. G. Weissert," Wis. Academy Review, vol. 28, no. 3 (June, 1982).  
 "Sturgeon Bay, Wisconsin: Historical Overviews, 1850-1930," Studies in Downtown Revitalization and Historic Preservation Planning, (Milwaukee, 1982).

## Request for Proposals No. DACW49-83-R-0019

PART ISection C - Description/Specifications1. INTRODUCTION

1.1 The purpose of this study is to locate and identify known and unknown cultural resources within the study area as shown in Attachments 2 and 3.

1.2 The study will consist of an inventory of architecturally, archaeologically and historically significant sites.

1.3 This action is being undertaken in accordance with the National Historic Preservation Act (P. L. 89-665), as amended; the National Environmental Policy Act of 1969 (P.L. 91-190); Executive Order 11593, "Protection and Enhancement of the Cultural Environment"; the Advisory Council on Historic Preservation, "Procedures for the Protection of Historic and Cultural Properties" (36 CFR, Part 800); and the Corps of Engineers, Department of the Army, "Identification and Administration of Cultural Resources (33 CFR, Part 305).

2. GENERAL REQUIREMENTS

2.1 This report will serve several functions. It will be used as a planning tool which will serve the Buffalo District, Army Corps of Engineers, in meeting its obligation to preserve and protect our cultural heritage. It must also be a comprehensive, scholarly document that not only fulfills mandated legal requirements, but also serves as a scientific reference for any future cultural resources studies. As such, the report's content must be both descriptive and analytic (36 CFR, Part 66).

2.2 The Contractor must perform this work in a manner which will insure the greatest contribution to the study of the history and prehistory of New York State.

2.3 The Contractor must conduct this study in close cooperation with the State Historic Preservation Officer. Evidence of this cooperation must be documented in the report.

2.4 The extent and character of this study will be subject to the general supervision, direction, control and approval of the Contracting Officer.

3. SPECIFIC REQUIREMENTS-~~INVESTIGATION~~

3.1 The Contractor shall conduct a cultural resources literature search for the defined study area which will include, but not be limited to, a description of prehistoric cultural areas and subareas; a description of defined settlement patterns; a discussion of the chronology of the area; a discussion of the historic settlement of the area; and a discussion of the salient events which shaped the history of the area.

3.2 The Contractor shall conduct an archival and records search of the study area which will provide an inventory of known sites of archaeological, historical, and architectural interest, and which will provide sufficient

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information to guide and determine the scope and direction of the cultural resources reconnaissance study required by paragraph 3.3.

3.3 The Contractor shall conduct a cultural resources reconnaissance as defined in 33 CFR, Part 305 and ER 1105-2-50. The study must include, but not be limited to, a field examination (and testing when necessary) of a representative portion of the planning area adequate to assess, in general terms, the numbers, locations, affiliations, components, spatial distribution, data potential, and other salient characteristics of historic properties.

3.4 The Contractor must keep standard field records which may be reviewed by the Contracting Officer. These records shall include, but not be limited to, field notebooks, site survey forms, field maps, photographs, and stratigraphic profiles.

3.5 The Contractor must obtain permission from the appropriate landowners to enter their property for the purposes of conducting the field survey and testing.

3.6 The field work shall be closely coordinated with the Contracting Officer. The Contracting Officer reserves the right to have a representative of the Buffalo District present during the performance of the field work.

4. FIELD STUDY AREA

The study area, for purposes of the field work to be performed under this contract, is shown on Attachments 2 and 3. Also included, as Attachment 1, are brief descriptions with corresponding illustrations of the various alternative navigation improvement plans under consideration. The latter is to be used as supplemental information in formulating the technical proposal for this cultural resources study.

5. SPECIFIC REQUIREMENTS-REPORT PREPARATION

5.1 The Contractor shall prepare a report detailing the work done, study rationale, survey results, and recommendations for any additional testing for sites which appear to be potentially eligible for inclusion on the National Register of Historic Places. The report shall include, but not be limited to, the following sections: an abstract, an introduction, a brief section placing the project area in a regional cultural context, a section on the methodology employed, a brief evaluation of previous cultural resources in the project area, recommendations for testing of sites which appear in general terms to be potentially eligible for inclusion on National Register of Historic Places, a concise definitive summary, and references.

5.2 The abstract shall be a synopsis of the report where the reader may find the general conclusions and recommendations resulting from the cultural resource reconnaissance and assessment.

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5.3 The introduction shall include, but not be limited to, the following: the purpose of the survey, delineation of the study boundaries, and a general statement of the nature of the study conducted.

5.4 The regional setting, including environmental factors affecting the location of cultural resources and the known cultural history, should be briefly summarized.

5.5 The methodology used for data collection and analysis shall be described in sufficient detail for reviewer to understand what was done and why. This shall include, but not be limited to, a discussion of surveying and sampling procedures, the types of data collected, artifact retrieval procedures, recording techniques, classificatory schemes, methods of chronological determination, and any special analytical methods and techniques used. Maps which show the area surveyed, locations of any test pits, and location of cultural resources recorded shall be included.

5.6 There shall be a brief summary of the study findings and recommendations. It should be clear from this exactly what, if any, additional studies are recommended prior to construction of the proposed project. If there are no sites in the project area and no additional work is deemed necessary, a statement to this effect shall be included in the summary.

5.7 All references cited and/or utilized shall be listed in American Anthropological Association format. Contacts with other individuals shall also be cited.

5.8 If the report is authorized by someone other than the principal investigator, the principal shall prepare the foreward describing the overall research context of the report, the significance of the work, and any other related background circumstances relating to the manner in which the work was undertaken.

5.9 The following items shall be included as appendices to the report: the vitae of the principal investigator and any professionals who were directly involved in the preparation of the report, this "Scope of Work", any letters of comment on the draft report from other agencies forwarded by the Contracting Officer, and the comments on the draft report offered by the Contracting Officer.

6. SUBMITTALS

The Contractor shall submit eight (8) copies of a double-spaced draft report within ninety (90) calendar days after receipt of the Notice to Proceed. The Contracting Officer will provide the Contractor with comments on the draft report within sixty (60) calendar days after receipt of the draft. The Contractor shall submit one (1) original and twenty (20) copies, single-spaced, of the final report, including appropriate revisions in response to the Contracting Officer's comments within fifteen (15) calendar days of those comments. All photographs shall be offset printed and all maps shall be reproducible and not exceed 11 x 15 inches in size.

PART I

Section E - Inspection and Acceptance

1. INSPECTION OF SERVICES

(a) The Contractor shall be responsible for the professional quality, technical accuracy and coordination of all services contracted for herein. The Contractor shall, without additional compensation, correct or revise any errors or deficiencies in the services contracted for herein.

(b) Neither the Government's review, approval or acceptance of, nor payment for, any of the services required under this contract shall be construed to operate as a waiver of any rights under this contract or of any cause of action arising out of the performance of this contract, and the Contractor shall be and remain liable to the Government in accordance with applicable law for all damages to the Government caused by the Contractor's negligent performance of any of the services furnished under this contract.

(c) The rights and remedies of the Government provided for under this contract are in addition to any other rights and remedies provided by law.